GPS Electronic Logbook

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Solution description

If you are one of those drivers or fleet managers who find doing your logbook a tedious and time-consuming process, we have got good news for you. Thanks to Teltonika GPS trackers, you can automate nearly the whole process by using an accurate and reliable GPS electronic logbook.

Here You will find how to prepare and test this solution.

What you need for the solution?

- Teltonika FM device which is compatible with this use case. Recommended products are: FMB001, FMC001, FMM001, FM3001, FMB002, FMB010, FMB003, FMB020, FMP100 (FMP100 is connected via cigarette light socket).
- The SIM card in order to receive data to Your server.
- Teltonika Configurator to set up FM device correctly for the solution.
- FOTA WEB to remotely send the configuration to the device.
- BTAPP / Driver application for Private Mode or Business Mode selection.

Installation

All of the recommended products are "Plug and Play" devices. It means that devices are directly plugged into vehicles OBDII socket and after configuration is complete - devices are set for use. Although, if plugged OBDII device is too hard to reach and vehicle parts are interfering with GPS signal or vehicle parts need to be removed/opened to access OBDII socket and afterward parts no

longer fit or close - Teltonika offers OBDII extension cable. [1]

Apart from device configuration (more later) and installation into the vehicle, the GPS electronic logbook doesn't require additional hands-on work.

Configuration

1. Prerequisites:

1.1. Read through **First start guide**

2. Configuration of GPS electronic logbook scenario:

Parameter ID - Parameter name

- 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, 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.

Configuration of Trip scenario:

- 11800 - Scenario priority (0 - Disable, 1 - Low, 2 - High, 3 - Panic).

- 11801 - Eventual settings (0 - Disable, 1 - Enable), if disabled - trip settings will come with periodical data.
- 11802 - Mode (0 - Continuous, 1 Between Records). If the *Between Records* option is selected - distance will be counted until any record is made. Then odometer will be reset to zero and

start counting until the next record is made. If the *Continues* option is selected - the distance will continue counting between the trip start and trip stop and the odometer will not reset.
- 11803 - Start Speed (km/h). When selecting a value for Start Speed - only after this value (speed) is exceeded, the Trip scenario will be activated. If the Start Speed value is set to 0 (km/h) - the scenario will be activated after the ignition turns on. *More about ignition settings - below.*
- 11804 - Ignition OFF timeout (s).
- 7031 - ID of SMS recipient.
- 8031 - SMS Text.
- 700 - Eco Score Allowed Events.

- 11806 - Odometer Calculation Source (0 - GNSS, 1 - OBD).
- 11807 - current Odometer Value (km). Odometer data will be counted from provided value.

Configuration of Ignition Source:

- 101 - Ignition Settings (Ignition has 14 different settings, for more information click **here**).

Note: if Ignition Source is selected only to Accelerometer - ignition will be activated when the vehicle starts moving. Engine RPM - cannot be used for every vehicle model. Direct OBDII devices gather information received via the OBDII socket. If the vehicle doesn't provide Engine RPM via mentioned socket - Engine RPM cannot be used as Ignition Source.

- 104 - High Voltage (value range: 13200 - 30000 mV).
- 105 - Low Voltage (value range: 0 - 29999 mV).

Configuration of Eco/Green driving scenario:

- 11000 - Scenario priority (0 - Disable, 1 - Low, 2 - High, 3 - Panic).

- 11004 - Maximum Acceleration (m/s^2).
- 11005 - Maximum Braking (m/s^2)
- 11006 - Maximum Cornering (m/s^2)

- 11007 - Source (0 - GPS, 1 - Accelerometer). Green driving scenario according to selected data source.

- 11019 - Advanced Eco Driving (0 - Disable, 1 - Enable). If enabled, Eco Driving Average (ID.: 11011) and/or Eco Driving Maximum (ID.: 11015) settings can be changed.

- 11008 - Eco/Green Driving Duration (0 - Disable, 1 - Enable).

- 7034 - ID of SMS recipient.

- 8034 - SMS Text.

Note: Maximum acceleration, braking, and cornering values should be set according to vehicle type, power, weight and etc. Best values can be approached by practical testing. E.g. testing cornering parameters - take the same turn at a different speed (30km/h, 20 km/h, 40 km/h) and check if Eco/Green Driving event has been triggered for cornering - if it feels as turning on 30km/h is harsh but the event is not triggered - lower Max Cornering values and reattempt the test.

Configuration of Excessive idling scenario:

- 11200 - Scenario priority (0 - Disable, 1 - Low, 2 - High, 3 - Panic).

- 11203 - Eventual settings (0 - Disable, 1 - Enable), if disabled - excessive idling data will come with periodical data.
- 11205 - Time To Stopped (s). Represents how long vehicle should not move with engine ON.
- 11206 - To To Moving (s). Represents how long vehicle should be moving with engine ON, to exit idle state.
- 7033 - ID of SMS recipient.
- 8033 - SMS Text.

Quick start: From default configuration to GPS electronic logbook records in one SMS:

```
"  setparam
2001:APN;2002:APN_username;2003:APN_password;2004:Domain;2005:Port;2006:0;118
00:1;11801:0;11806:1;11000:2;11007:1;11200:2"
```

This SMS will set up Your device to send Trip, Eco/Green driving, and Excessive idling data to Your previously provided server.

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

3. BTAPP Mobile application

After making configuration for Your device, it is time to **download BTAPP**. Keep in mind, app and device connection is established via Blue-tooth. Devices by default come with Bluetooth® enabled and visible. After pairing to the device - You can change the trip type of Your trips by performing a long press on the icon and confirming the change.

Parsing information

1. Prerequisites:

1.1. Open TCP/UDP port

1.2. Go to Java parser first start guide

2.Parsing example:

Unparsed received data in hexadecimal stream

000000000000005E08010000017716AE03D8010F0F22D720982E9C007E00120A002FFD1609E
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

Packet information can be displayed visually. In the picture below, the event location is displayed on the map. The dot on the map represents a record. By clicking on it, it is possible to see what kind of information is gathered in the particular entry.

In order to visually see received information on the platforms:

TAVL: Open TAVL → select client → select Street Map → select device → to choose the date from which to show the records → push advanced → push show button and then you will see in the left down corner all information.

WIALON: Open WIALON → open messages → push unit (select your device) → choose the date from which to show the records → select message (data messages) → push execute button and you will see all information. (Note**:** *Figure below is an example and doesn't represent the actual visualization of the packet in the parsing example*).

BTAPP:

Bluetooth® connection to monitor and score driver behavior. Real-time events notifications about harsh acceleration, braking, cornering, overspeeding, idling, and RPM. Solution designed to improve driver behavior and productivity.

- You must connect to the FMB device by clicking the Bluetooth® icon, and selecting your FMB device.
- Each event that was detected by the FMB device will be displayed in the application as well. Users can be notified visually, the event icon will turn yellow and the event count will be increased accordingly, and by sound alert as well (can be optionally enabled in application settings).
- Eco score is calculated by FMB device depending on total event amount and trip distance.

Eco score, distance, and duration are being updated periodically automatically.

- Trip status can be Ongoing and Finished. The trip finish is decided by FMB configuration. If the application will be connected to an FMB device during an ongoing trip – the application will update event count, score, distance, and trip duration for an ongoing trip.