Towing detection

Introduction

With Towing detection the driver can be informed, that his car is being towed. Information about such events is sent to the server, therefore the driver might still have time to come back to his vehicle before it is taken away. This would help to save the driver's time and money.

Feature description is valid for the following FM devices with the latest firmware version:

● FM-Tco4 HCV/ HCV 3G / HCV BT
● FM-Tco4 LCV/ LCV 3G / LCV BT
● FM-Pro4 / Pro4 3G / Pro4 BT
● FM-Eco4/4+
● FM-Eco4 light/light+ /light 3G / light+ 3G
● FM-Plug4/4+

You can get the latest firmware and configurator versions from our documentation web site: doc.ruptela.lt

Legal information

Document change log

Date	Version	Change details
2016-01-13	1.0	Initial draft
2016-02-19	1.1	Sleep mode behavior described.
2016-07-21	1.2	Towing detection in sleep mode for FM-Eco4/4+/light/light+.
2016-11-09	1.3	Description for "Engine check after event" field.
2017-02-07	1.4	More detailed configuration recommendations.

Description

The towing detection mechanism works only when the engine is turned off. Also, the engine source cannot be set to the movement sensor, because this disables towing detection.
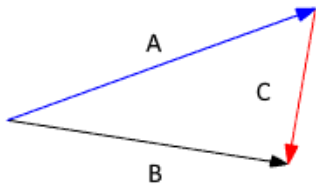
Operation

If the configured delay time has passed (time spent when the engine is switched off), the device captures its current acceleration along all 3 axis.

If the device detects a change in acceleration (defined in configuration) and if it lasts for a defined time period, then towing is detected.

After towing detection conditions are satisfied, the device waits until the configurable "engine check after event" delay passes. While waiting, the device constantly monitors the vehicle's ignition state. If the ignition sate changes to "ON", the towing event will be discarded. If the ignition state remains "OFF" for the whole delay period, the device sends records with towing event data to the server.

Detection logic

The device finds the difference between the initial acceleration vector and the current acceleration vector. This difference is then compared with the configured sensitivity value, expressed in degrees.

"Towing alarm" IO parameter

Towing detection functionality comes with a new IO parameter called "Towing alarm".

IO ID	Parameter name	Name in configurator	Size, B	Value range	Description
410	Towing alarm	Towing alarm	1	0 - 1	0 – alarm off, 1 – alarm on

IO parameter has the value of 0, when the engine is turned on or the acceleration vector is at its initial position.

When conditions defined in the towing detection configuration are satisfied, "Towing alarm" IO parameter changes its value to 1. This information is sent to the server.

Note

In order to enable the "Towing alarm" parameter in the IO settings window, extended protocol version v1.1 has to be used.

Operation in Sleep / Deep sleep mode

When towing detection the IO parameter is enabled together with Sleep or Deep sleep mode, the device itself can go to sleep mode, however its accelerometer will never sleep.
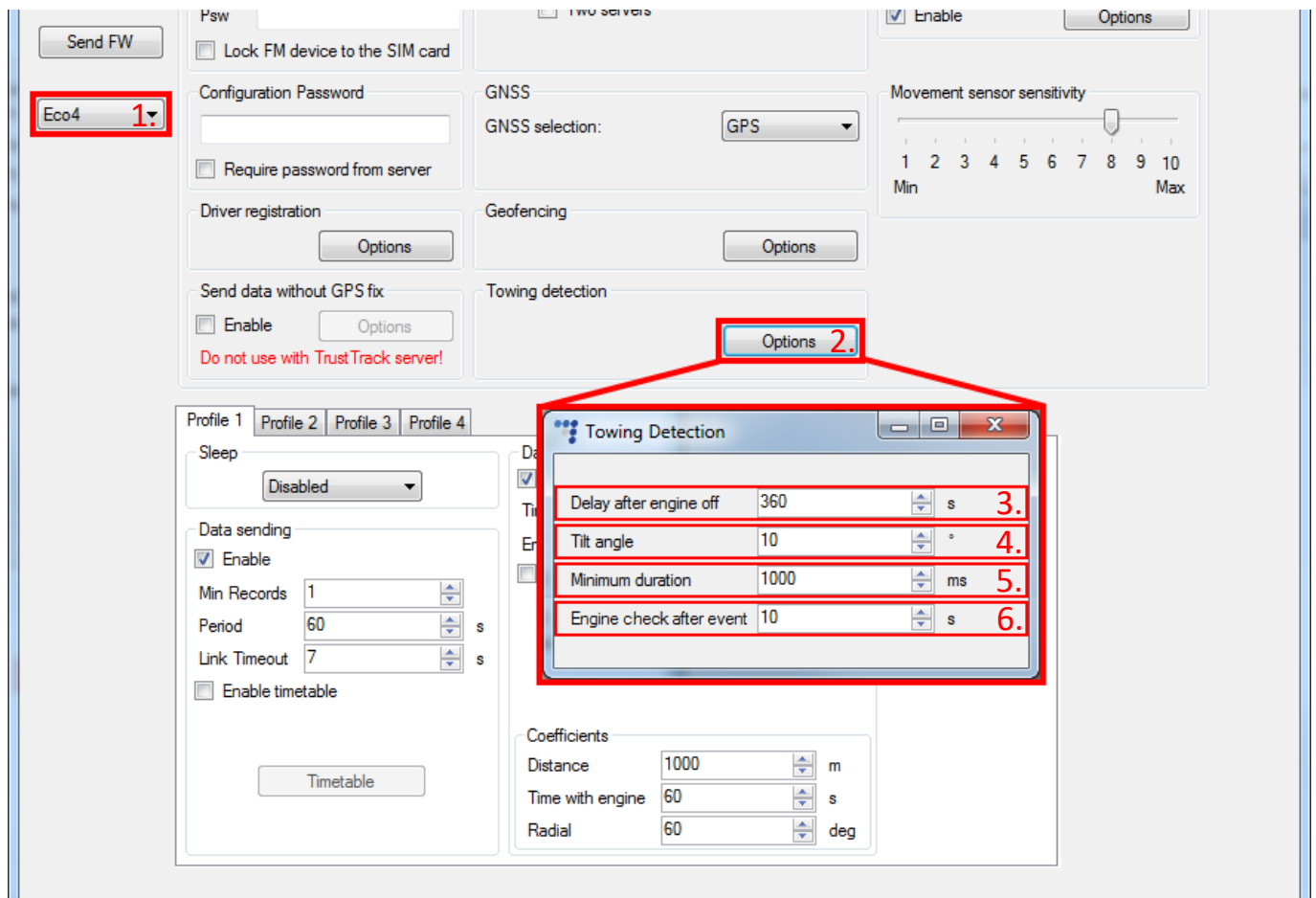
Note

Towing detection functionality will slightly increase device power consumption in Sleep or Deep sleep mode.

Configuration

Towing detection configuration

The first part of the configuration is about setting correct limiting values for the towing detection.

1. In the main configurator window choose your device *(Tco4 LCV, Tco4 HCV, Pro4, Eco4 or Plug4)*.
2. Under **Global** settings, in **Towing detection** section locate and click on the "Options" button. It opens up a new "Towing Detection" popup window with four configurable fields.
3. **Delay after engine off** – Time that has to pass before towing can be detected. Range for delay values is from 1 to 65535 seconds. The default value is 360 s.
4. **Tilt angle** – If the difference between initial acceleration vector and the current acceleration vector is higher than the configured value, then towing can be detected. Range for the sensitivity value is from 0 to 180 degrees. The default value is 10 degrees.
5. **Minimum duration** – Changes in detected acceleration have to last for this time period, only then towing will be detected. Range for minimum duration value is from 100 to 65535 milliseconds, minimum step is 100 ms. The default value is 1000 ms.
6. **Engine check after event** – After towing detection conditions are satisfied, the device waits until the configurable "engine check after event" delay passes. While waiting, the device constantly monitors the vehicle's ignition state. If the ignition state changes to "ON", the towing event will be discarded. If the ignition state remains "OFF" for the whole delay period, the device sends records with towing event data to the server. Range is from 0 to 60 seconds. The default value is 10 s.

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Enabling "Towing alarm" IO parameter

Second part of the configuration deals with IO events. In order to see the "Towing alarm" parameter in reports you have to enable it in the **IO settings** window.

1. In the **IO events** section click on the "Options" button. It opens up a new "IO settings" window.
2. The "Towing alarm" parameter can be selected only when v1.1 protocol is used. In the **Protocol selection** section put a tick in the **Send I/O data with v1.1 protocol** check box.
3. Select a free slot for a new parameter that you want to enable.
4. In the **IO properties** section tick the **Enable** check box, otherwise the slot will remain empty.
5. **ID** contains the parameters list. Choose *Towing alarm*.
6. It is recommended to set record generation with **Event on** *Change* and **Priority** *High*. Then the device will send data about towing events as soon as they occurs. Even if the device is in sleep/deep sleep mode, it will wake up and send records to the server.

Once the parameter is enabled, close the "IO settings" window and send the configuration to the device.