

# Towing Detection

## 1 Introduction

### 1.1 About the Functionality

The towing detection functionality informs the driver when their car is being towed. This information is sent directly to the server, therefore the driver will receive this information immediately and can come back to their vehicle in time before it is taken away.

### 1.2 Legal Information

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### 1.3 Compatibility

This functionality is compatible with the following devices with the newest firmware version:

- HCV5
- LCV5
- Pro5
- Trace5
- FM-Tco4 HCV
- FM-Tco4 LCV
- FM-Pro4
- FM-Eco4
- FM-Eco4 S
- FM-Eco4 T
- FM-Eco4 RS T
- FM-Plug4

## 1.4 Contact Information

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## 1.5 Document Changelog

Version	Date	Modification
2.0	2020-09-21	Added: Device Center configuration description. Updated: Manual structure and design.

## 1.6 Notations

The following notations are used in this document to highlight important information:

### **Bold text**

Used to indicate user interface elements or for emphasis.

### *Italic text*

Used to indicate items that belong to a list and can be selected.

### **Note**



Used to highlight important information or special conditions.

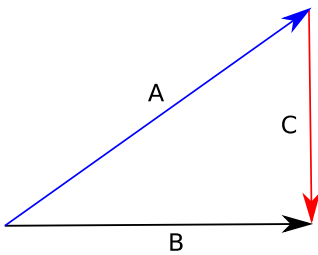
## 2 Description

### 2.1 Requirements

The towing detection functionality only works when the engine is turned off. Additionally, the engine source cannot be set to the movement sensor, because this will disable the towing detection.

### 2.2 Detection Logic

A configured delay time after the engine is turned off must pass. The device will then capture its current acceleration along all 3 axes. It finds the difference between the initial acceleration vector and the current acceleration vector values. This difference is then compared with the configured sensitivity value, expressed in degrees. If a change in acceleration is detected and if it lasts for a defined time period, it will be recognized as a towing event.



After all towing detection conditions are met, the device will wait a defined amount of time. During this time, it will constantly monitor the vehicle's ignition state. If the ignition state changes to *ON*, the towing event will be discarded. If the ignition state remains *OFF* during the whole delay period, the device will send records with the towing event data to the server.

## 3 Configuration in Device Center

To start the configuration, follow these steps:

1. Start the Device Center.
2. Click **Configure device** and select **Connect device**.
3. Select your device. If the device was previously configured, click **Load from device**. Open the **Towing detection** section.
4. Toggle the button to turn **on** the functionality and see the available parameters.
5. Set the values for the following parameters:

<b>Delay after engine is off (s)</b>	The time that has to pass after ignition is off before towing can be detected. The delay can be set between 1 and 65535 seconds. Default value: 360 s.
<b>Minimum tilt angle (deg)</b>	If the difference between the initial acceleration vector and the current acceleration vector is higher than this value, towing is detected. The range for this value can be set from 0 to 180 degrees. Default value: 10 degrees.
<b>Engine check after event (s)</b>	Set the time the device must wait before registering the towing event. During this time, the device will constantly monitor the vehicle's ignition state. If the ignition state changes to <i>ON</i> , the towing event will be discarded. If the ignition state remains <i>OFF</i> during the whole delay period, the device will send records with the towing event data to the server. The range can be set from 0 to 60 seconds. Default value: 10 s.
<b>Minimum tilt duration (ms)</b>	Set the duration for how long the changes in acceleration have to last for towing to be detected. The range can be set from 100 to 65535 milliseconds. Default value: 1000 ms.

6. Click **Finish** to save your changes.

## TOWING DETECTION

Towing detection lets you know when the vehicle is being towed. Towing is detected when vehicle tilt changes by a set angle.

On **4**

**5**

Delay after engine is off (s)

360



Minimum tilt angle (deg)

10



Engine check after event (s)

10



Minimum tilt duration (ms)

1000



Back

**6**

Finish

# 4 Configuration in Advanced Configurator

The advanced configurator offers the same selection of configurable settings for the towing detection functionality, as well as the ability to enable and configure the *Towing alarm* IO parameter.

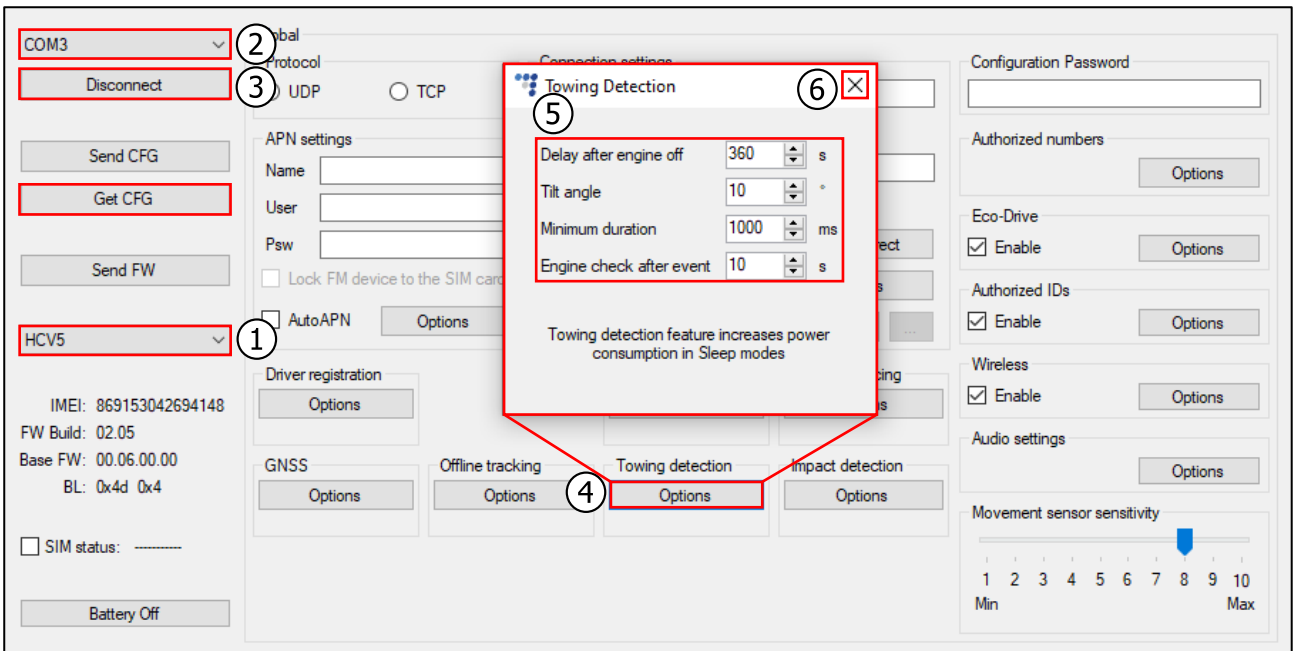
## 4.1 Towing Detection Configuration

To start the configuration, follow these steps:

1. Open the advanced configurator. Select your tracking device.
2. Select the COM port to which your device is connected.
3. Click **Connect**. If the device was previously configured, click **Get CFG**.
4. In the **Towing detection** section, click the **Options** button.
5. In the **Towing detection** window, set the values for the following parameters:

<b>Delay after engine off</b>	The time that has to pass after ignition is off before towing can be detected. The delay can be set between 1 and 65535 seconds. Default value: 360 s.
<b>Tilt angle</b>	If the difference between the initial acceleration vector and the current acceleration vector is higher than this value, towing is detected. The range for this value can be set from 0 to 180 degrees. Default value: 10 degrees.
<b>Minimum duration</b>	Set the duration for how long the changes in acceleration have to last for towing to be detected. The range can be set from 100 to 65535 milliseconds. Default value: 1000 ms.
<b>Engine check after event</b>	Set the time the device must wait before registering the towing event. During this time, the device will constantly monitor the vehicle's ignition state. If the ignition state changes to <i>ON</i> , the towing event will be discarded. If the ignition state remains <i>OFF</i> during the whole delay period, the device will send records with the towing event data to the server. The range can be set from 0 to 60 seconds. Default value: 10 s.

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6. Close the **Towing detection** window. Changes to the values will be saved automatically.



## 4.2 Towing Alarm IO Parameter

The towing detection functionality uses the *Towing alarm IO* parameter.

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

The IO parameter has the value of 0 when the engine is turned on or the acceleration vector is at its initial position. This value changes to 1 when the conditions that define towing detection are met. This information is sent to the server.



To enable the *Towing alarm* parameter in the **IO settings** window, the extended protocol v1.1 has to be used.

If the towing detection functionality or the *Towing alarm IO* parameter is enabled in sleep mode, the device can still go to sleep mode, however, the accelerometer will remain active.



The towing detection functionality will slightly increase the device power consumption in sleep mode.

## 4.3 Enabling the Towing Alarm IO Parameter

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 the **Options** button. This opens a new **IO settings** pop-up window.
2. The *Towing alarm* parameter can only be selected if the v1.1 protocol is used. In the **Protocol selection** section, tick the **Send I/O data with v1.1 protocol** checkbox.
3. Select a free slot for the parameter that you want to enable.
4. **ID** contains a list of available IO parameters that can be enabled. Select the *Towing alarm* parameter.
5. It is recommended to set the record generation with **Event on** set to *Change* and **Priority** set to *High*. This way, the device will send data about towing events as soon as they occur, even if the device is in sleep mode.
6. **Enable** will add the IO parameter from **ID** to the currently selected slot (3). Keep in mind, that it will overwrite an existing parameter if one is already enabled on it.
7. Once the parameter is enabled, close the **IO settings** window and click **Send CFG** to send the configuration to the device.

