

Eco-Drive Configuration

User Manual

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1 Introduction

1.1 About the Functionality

The Eco-Drive functionality is used for monitoring the driving habits of the drivers. This document describes how to configure the Eco-Drive functionality and what options may be used. A detailed description on how the functionality works and a full list of Eco-Drive parameters can be found in the [Eco-Drive parameters description](#) document.

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

You can get the newest firmware and configuration from our documentation website doc.ruptela.it

1.4 Contact Information

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1.5 Document Changelog

Version	Date	Modification
2.0	2020-09-15	Described standard Device Center configuration. Updated: User 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, as well as examples.

Note



Used to highlight important information or special conditions.

Caution



Used to mark actions that require caution when handling the product.

2 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 **Eco-Drive** section.
4. Toggle the Eco-Drive button to turn **on** the functionality and see the available parameters.
5. Select a **Profile** (*Light vehicle* or *Truck*). The selected profile will set the default recommended values for the vehicle type.
6. In the **Input** section, select the data source to be used for calculations. The *Accelerometer* option provides the most accurate results but requires up to an hour of calibration and the device to be firmly fixed to the vehicle. The *GPS* option is less accurate but does not require calibration.
7. Set the **Values** for braking, acceleration, speeding limits, and an idling delay.
8. Turn the Eco-drive panel on or off in the **Output** section. When turned on, the driver will be notified about their driving in real-time. An [Eco-Drive panel](#) must be connected.
9. Click **Finish** to save your changes.

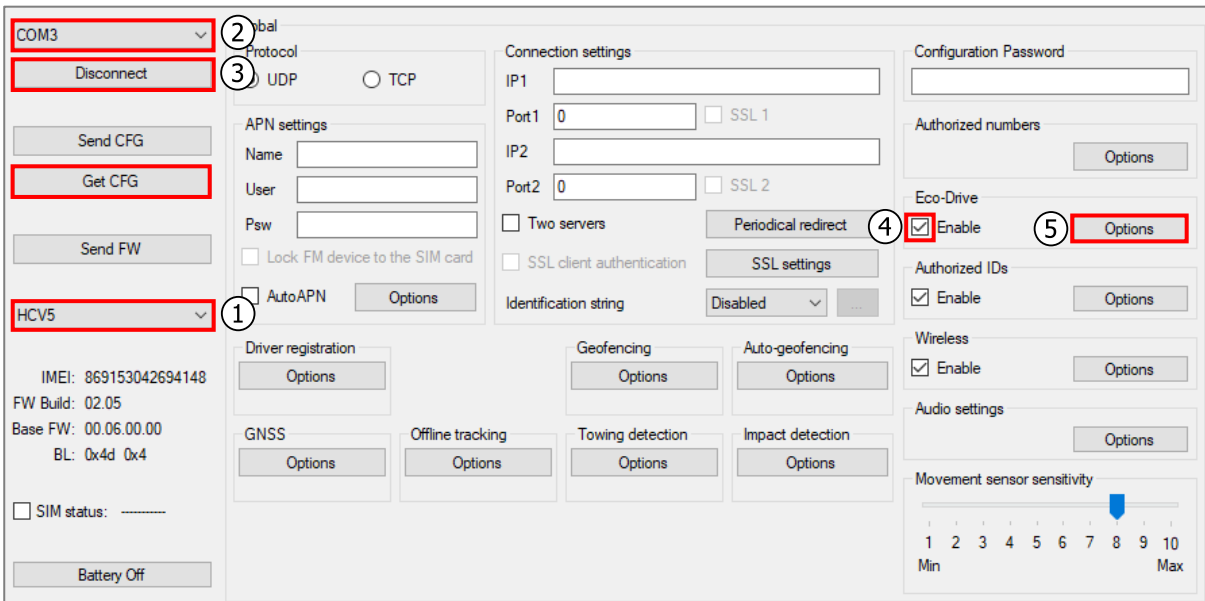
The screenshot shows the 'ECO-DRIVE' configuration screen. At the top, there is a toggle switch for 'Eco-Drive' set to 'On' (4). Below this is a 'Profile' dropdown menu set to 'Light vehicle' (5). The 'Input' section (6) has a 'Data source' dropdown set to 'GPS'. The 'Values' section (7) contains four input fields: 'Extreme braking limit (m/s²)' set to 3.0, 'Harsh braking limit (m/s²)' set to 2.0, 'Harsh acceleration limit (m/s²)' set to 3.0, and 'Speeding limit (km/h)' set to 110. The 'Output' section has an 'Eco-Drive panel active' toggle switch set to 'Off' (8). At the bottom right, there is a 'Finish' button (9) and a 'Back' button.

3 Configuration in Advanced Configurator

The advanced configurator offers a wider selection of configurable settings for the Eco-Drive functionality. The configuration is split into two parts: **Eco-Drive** configuration and **IO events** configuration.

3.1 Eco-Drive Configuration

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 **Eco-Drive** section, tick the **Enable** checkbox. Click **Options** to open a new **Eco-Drive** window.



1. Select a **Profile** for your vehicle. You can select between *Custom*, *Light vehicle*, or *Truck*. Profiles set the default recommended parameter values for that vehicle type. However, you can easily change these values according to your needs.
2. Enter the desired values for each parameter or leave them at default.
3. A different number of **Data sources** are available for different devices. Some sources have fewer Eco-Drive parameters that will be greyed out upon selection and cannot be modified. More information about the Eco-Drive sources can be found below in the [Eco-Drive sources](#) chapter.

4. The following set of options are available only if the data source is set to either *CAN*, *CAN+ACC*, or *CAN+GPS*:

Ignore CAN brake switch	The brake pedal position (<i>CAN brake switch</i> parameter) will not be used in the Eco-Drive event calculations and the <i>CAN wheel based speed</i> parameter will be used instead. If <i>CAN wheel based speed</i> is not available and <i>Alternative data source selection</i> is enabled, <i>GPS speed</i> will be used instead. Default value: Disabled
Ignore RPM when fuel rate is below	Set the fuel rate value. When below this value, exceeding maximum RPM events will be ignored. Default value: Disabled
Ignore overspeeding when fuel rate is below	Set the fuel rate value. When below this value, overspeeding events will be ignored. Default value: Disabled
Ignore RPM when angle of inclination is above	Set the angle of inclination. When above this value, exceeding maximum RPM events will be ignored. Default value: Disabled



ECO braking duration and *ECO braking distance* will be calculated only if *CAN brake switch* is available.

Eco-Drive

Profile: **Truck** (1)

(2)

Overspeeding limit	90	km/h
RPM green band low limit	500	RPM
RPM green band high limit	2000	RPM
Harsh braking limit	1.0	m/s ²
Extreme braking limit	2.0	m/s ²
Harsh acceleration limit	2.0	m/s ²
Cornering limit	2.0	m/s ²
Idling delay	360	s
Idling speed	5	km/h
Cruise control speed	70	km/h

(3)

Data source: CAN

(4)

Ignore CAN brake switch

Ignore RPM when fuel rate is below 0.0 l/h

Ignore overspeeding when fuel rate is below 0.0 l/h

Ignore RPM values when angle of inclination is above 0 °

Highest gear speed: 75 km/h

Engine load threshold: 90 %

	Minimum	Maximum
Free rolling RPM	450	650
RPM range 1	1	900
RPM range 2	900	1300
RPM range 3	1300	1500
RPM range 4	1500	2300

Engine braking conditions

Speed is more than: 0 km/h

Fuel rate is below: 1.0 l/h

RPM is more than: 650

Calculate data only when engine is ON

Custom Engine source Customize

Eco-Drive panel connected

Alternative data source selection

Beeper Enabled

Enable IO

Close

5. Enable or disable the following parameters by ticking a checkbox next to them:

Calculate data only when engine is ON	Data will only be calculated when ignition is on. This is necessary to avoid false Eco-Drive data calculation when the vehicle is standing with ignition off. Default value: Disabled
Custom Engine source	Allows customization of how the engine state will be determined for Eco-Drive data calculation. More information can be found in the Eco-Drive parameters description document. Default value: Disabled
Use device ignition settings for Eco-Drive panel	Tick to use the same ignition detection settings for the Eco-Drive panel as it is set in the device ignition detection setup. Default value: Disabled
Eco-Drive panel connected	Tick if an Eco-Drive panel is connected to the device. Connection schemes for different devices are provided in the Eco-Drive Panel Connection document. Default value: Disabled
Alternative data source selection	If the data source is set to ACC or GPS, it will be disabled automatically. When enabled, it functions as follows: <ol style="list-style-type: none">1. CAN, CAN+ACC, GPS+CAN data source is set: if CAN speed data from the CANbus line is not available, then the GPS speed data will be used instead. If RPM data from the CANbus line is not available, then the power voltage data will be used to determine the engine start.2. OBD, OBD+ACC, GPS+OBD data source is set: if speed data from OBD is not available, then the GPS speed data will be used instead. If RPM data from OBD is unavailable, then the power voltage data will be used to determine the engine start. Default value: Enabled
Beeper enabled	When ticked, the Eco-Drive panel will beep when a value is exceeded (e.g. if overspeeding). Default value: Enabled

6. Click **Enable IO** to enable the standard Eco-Drive IO parameters. This reduces the amount of IO parameters that need to be enabled in the next part of the configuration.

Eco-Drive

Profile: Truck

Overspeeding limit: 90 km/h

RPM green band low limit: 500 RPM

RPM green band high limit: 2000 RPM

Harsh braking limit: 1.0 m/s²

Extreme braking limit: 2.0 m/s²

Harsh acceleration limit: 2.0 m/s²

Cornering limit: 2.0 m/s²

Idling delay: 360 s

Idling speed: 5 km/h

Cruise control speed: 70 km/h

Data source: CAN

Ignore CAN brake switch:

Ignore RPM when fuel rate is below: 0.0 l/h

Ignore overspeeding when fuel rate is below: 0.0 l/h

Ignore RPM values when angle of inclination is above: 0 °

Highest gear speed: 75 km/h

Engine load threshold: 90 %

	Minimum	Maximum
Free rolling RPM	450	650
RPM range 1	1	900
RPM range 2	900	1300
RPM range 3	1300	1500
RPM range 4	1500	2300

Engine braking conditions

Speed is more than: 0 km/h

Fuel rate is below: 1.0 l/h

RPM is more than: 650

Calculate data only when engine is ON

Custom Engine source Customize

Eco-Drive panel connected

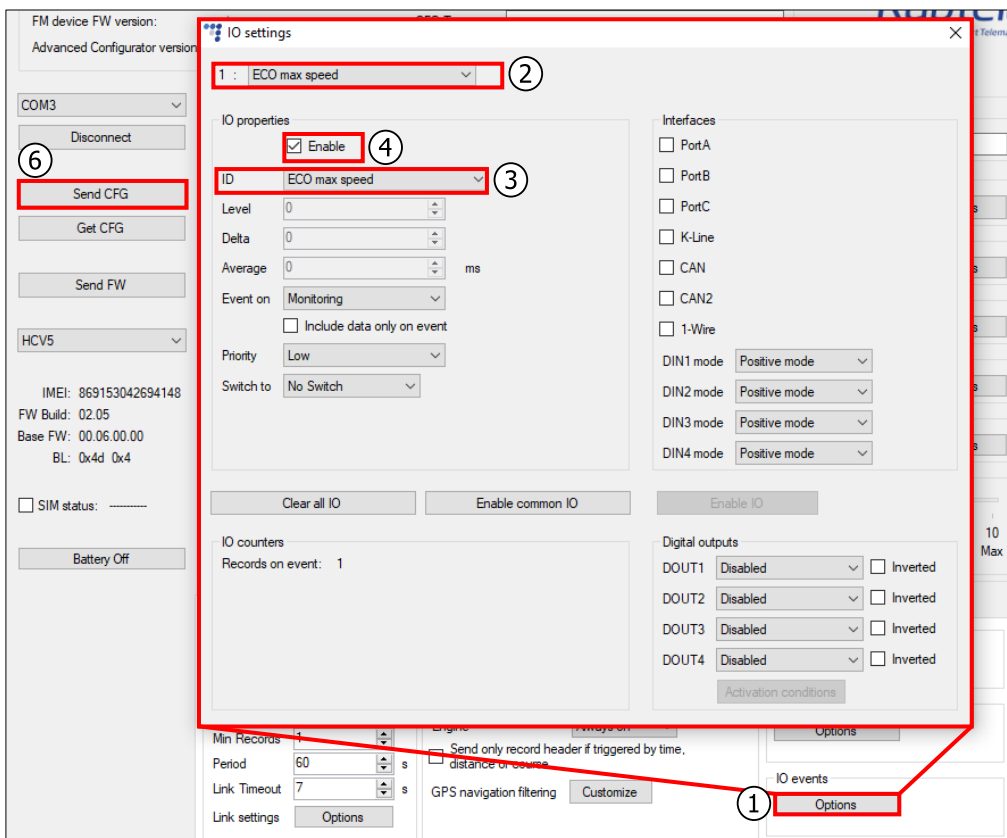
Alternative data source selection

Beeper Enabled

3.2 IO Events Configuration

To see the parameters in the reports, you have to select the proper IO parameters in **IO settings**. Remember, that Eco-Drive parameter availability depends on the previously selected data source. More information about data sources can be found in the [Eco-Drive sources](#) chapter.

1. In the **IO events** section, click the **Options** button. This opens a new **IO settings** pop-up window.
2. Select the slot that you want to enable. If **Enable IO** was selected in the previous part of the configuration, some IO parameters will already be enabled in the list. *Disabled* defines an open slot that has no IO parameter enabled on it.
3. **ID** contains a list of available IO parameters that can be enabled. Select an Eco-Drive parameter.
4. **Enable** will add the IO parameter from **ID** to the currently selected slot (2). Keep in mind, that it will overwrite an existing parameter if one is already enabled on it.
5. Repeat steps 2-4 until you enable all desired Eco-Drive parameters. The amount of total available parameters depends on the data source.
6. Once all the parameters are enabled, close the **IO settings** window and send the configuration to the device.



4 Eco-Drive Sources

You can manually select an Eco-Drive parameter source or choose to enable automatic source detection. Different devices can have different Eco-Drive sources.

Tracking devices	Eco-Drive source
Trace5, FM-Eco4, FM-Eco4 S, FM-Eco4 T, FM-Eco4 RS T	ACC, GPS
FM-Plug4	ACC, OBD, OBD+ACC, GPS, GPS+OBD
Pro5, FM-Pro4	ACC, CAN, CAN+ACC, GPS, GPS+CAN
LCV5, FM-Tco4 LCV	ACC, CAN ¹ , CAN ¹ +ACC, OBD, OBD+ACC, GPS, GPS+OBD, GPS+CAN
HCV, FM-Tco4 HCV	ACC, CAN, CAN+ACC, OBD, OBD+ACC, GPS, GPS+OBD, GPS+CAN

¹Only for LCV source.

The tracking devices can measure angular momentum (harsh cornering or aggressive turning), which is detected by the accelerometer. It is not available when CAN or OBD is used as a data source. Therefore, additional data sources can be selected:

- CAN+ACC: here Eco-Drive parameters are calculated from CAN data and cornering detection is done by the accelerometer.
- OBD+ACC: here Eco-Drive parameters are calculated from OBD data and cornering detection is done by the accelerometer.



Cornering events do not work in the TrustTrack system.

Some data sources have fewer Eco-Drive parameters than others. Unavailable parameters will be greyed out in the **Eco-Drive** window, for example, RPM bands and *Cruise control speed* for the GPS source. The availability of parameters according to the Eco-Drive source is shown in the table below:

IO parameter	Data source			
	CAN	Accelerometer	OBD	GPS
ECO absolute idling time	+	+	+	+
ECO brake counter	+	+	+	+
ECO cornering counter	CAN+ACC GPS+CAN	+	OBD+ACC GPS+OBD	+
ECO cruise control distance	+	Not available	Not available	Not available
ECO cruise control timer	+	Not available	Not available	Not available
ECO engine on timer	+	+	+	+
ECO extreme and harsh brake counter	+	+	+	+
ECO harsh acceleration counter	+	+	+	+

IO parameter	Data source			
	CAN	Accelerometer	OBD	GPS
ECO idling event	+	+	+	+
ECO idling timer	+	+	+	+
ECO max RPM	+	Not available	+	Not available
ECO max speed	+	+	+	+
ECO normal speed distance	+	+	+	+
ECO overspeeding timer	+	+	+	+
ECO RPM in green band distance	+	Not available	+	Not available
ECO RPM in red band timer	+	Not available	+	Not available
ECO braking value	+	CAN+ACC	+	+
ECO acceleration value	+	CAN+ACC	+	+
ECO cornering value	CAN+ACC GPS+CAN	CAN+ACC	OBD+ACC GPS+OBD	+



Extended Eco-Drive parameters can only be used with HCV5, LCV5, Pro5, FM-Tco4 HCV/LCV, and FM-Pro4 devices.

5 Calibration Process

If ACC, CAN+ACC, or OBD+ACC is selected as a data source, the accelerometer will need to be calibrated. This process is done automatically.

5.1 Requirements

- Data source: *ACC*, *CAN+ACC* or *OBD+ACC*
- A GPS fix for acceleration/braking
- **The FM device must be installed tightly – it cannot move, shake, or get loose.**
- No previous calibration. If the accelerometer was calibrated previously, it will not be calibrated again, unless the *accreset* SMS command is sent to the device.



The FM device installation is a crucial step – if the device is not installed tightly, the calibration will not be accurate and present incorrect data.

5.2 Calibration Sequence

Use the *accinfo* SMS command described below to obtain the calibration status.

The calibration is unlikely to be successful if the vehicle is driving in a straight line at a constant speed, for instance, in a motorway. In an urban location, the calibration should finish in around an hour of driving.

If you previously calibrated the accelerometer and then removed the device from the vehicle, or reinstalled it in a different location, the accelerometer must be recalibrated. There are two ways to recalibrate the accelerometer:

1. The recalibration is done automatically if the device detects that it is in a different position after turning on the engine.
2. You can recalibrate the accelerometer at any time using the *accreset* SMS command.



If you previously calibrated the accelerometer using an older firmware version without automatic calibration and then updated to a later version that has it, the existing calibration will not be changed.

5.3 SMS Commands

Command	Description	Response examples
<i>accinfo</i>	<p>Receives the status of the accelerometer. The device will send a response as in the example. The AXL state shows the accelerometer calibration process:</p> <ul style="list-style-type: none"> • 2 – calibration started • 3 – calibration is in progress • 11 – accelerometer is calibrated 	<p><i>AXL state:11 XYZo:120 -39 -945 Xc:131 -92 -94 -7 Yc:-138 97 -96 16 Zc:953 120 -39 -945</i></p>
<i>accreset</i>	Reinitiates the automatic calibration.	<i>ACC reset OK</i>
<i>accreset r</i>	<p>Reinitiates the automatic calibration and also sends SMS responses with each calibration step:</p> <ol style="list-style-type: none"> 1. <i>Acc calibration initiated. Drive normally to autocalibrate</i> – the requirements for autocalibration are met and autocalibration will commence. 2. <i>Up direction found. Drive normally to finish calibration</i> – the calibration is in progress. 3. <i>Calibration successful</i> – the calibration process finished successfully. 4. <i>Configuration error</i> – the requirements for autocalibration were not met. 	<p><i>Acc calibration initiated. Drive normally to autocalibrate; Up direction found. Drive normally to finish calibration; Calibration successful; Configuration error.</i></p>