Eco-Drive from GPS

Introduction

Eco-Drive from GPS feature allows user to experience advantages of Eco-Drive functionality without a need to perform accelerometer calibration, which can be fairly complicated. All available Eco-Drive parameters are calculated from the GPS data.

Feature available for FM-Tco4 LCV, FM-Tco4 HCV, FM-Pro4, FM-Plug4, Eco4/4+ and Eco4 light/light+ devices.

You can get the newest firmware and configurator from our documentation website: doc.ruptela.lt

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Document change log

Date	Version	Change details
2015-10-08	1.0	Initial draft
2015-11-06	1.1	Added schematics for Eco Panel connection
2015-11-18	1.2	Eco Panel connection changes
2016-01-12	1.3	"Idling speed" added
2016-01-27	1.4	FM-Tco4 HCV label
2016-06-22	1.5	GPS+CAN, GPS+OBD data source for cornering parameter, Alternative data source selection
2017-06-06	1.6	Described "Enable IO" function

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Eco-Drive from GPS parameters

Available parameters, when Eco-Drive data source is GPS:
- Overspeeding parameter is calculated from GPS speed.
- Harsh braking & extreme braking is calculated from GPS speed difference.
- Brake counter.
- Engine on timer.
- Harsh acceleration is calculated GPS speed difference.
- Cornering is calculated from GPS speed difference and change of angle.
- Idling delay (absolute idling time, idling event and idling timer) remains the same as in ACC mode.
- Idling speed is calculated from GPS speed.
- Max speed and normal speed distance parameters.

Not available parameters:
- Max RPM and RPM bands.
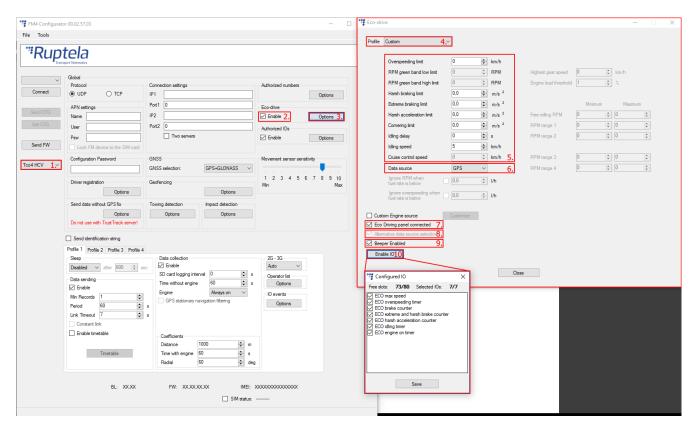- Cruise control speed.
- Extended Eco-Drive parameters

Configuration

FM Device has to be configured properly for the Eco-Drive functionality to work. Configuration is split into two parts. First part described below:

1. Open FM Configurator and select your device.
2. Under **Eco-Drive** section put a tick in the **Enable** checkbox.
3. Click on the "Options" button on the right.
4. In the "Eco-Drive" popup window select a proper **Profile** for your vehicle. Profiles help to distinguish between different vehicles and their Eco-Drive parameter values. You can choose between *"Custom"*, *"Light vehicle"* and *"Truck"*.
5. Each profile comes with recommended Eco-Drive parameter values. However, you can easily modify them to achieve wanted results.
6. Different number of **Data sources** are available for different devices. To enable Eco-Drive from GPS in the dropdown list choose "*GPS*". Some sources have fewer Eco-Drive parameters more information on his matter can be found in "Eco-Drive sources" chapter below.
7. Check **Eco Driving panel connected** if you have Eco-Drive panel attached to the device. Connection schemes for different devices provided in "Eco-Drive panel connection to FM-Tco4 HCV / FM-Tco4 LCV / FM-Pro4" and "Eco-Drive panel connection to FM-Eco4 / 4+ and FM-Eco4 light/light+" chapter below.

8. **Alternative data source selection** check box is enabled by default. If data source is set to ACC or GPS, it will be disabled automatically (greyed out). When active, it functions as follows:
   a. CAN, CAN+ACC or GPS+CAN data source has to be set. If CAN speed data from CANbus line is not available, then GPS speed data will be used instead. Also, if RPM data from CANbus line is not available, then power voltage data will be used to determine engine start.
   b. OBD, OBD+ACC or GPS+OBD data source has to be set. If speed data from OBD is not available, then GPS speed data will be used instead. Also, if RPM data from OBD is not available, then power voltage data will be used to determine engine start.
9. If **Beeper Enabled** is checked, Eco-Drive panel will beep on exceeded value (e.g. if over speeding).

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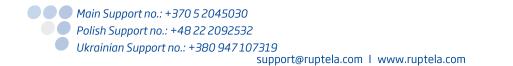support@ruptela.com I www.ruptela.com

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10. The user can click the "Enable IO" button. This will enable seven standard Eco driving IO parameters, thus reducing the amount of IO parameters that need to be enabled in the next part of the configuration.

Second configuration part deals with IO events. In order to see parameters in the reports you have to select proper IO parameters in the **IO settings**. Remember that Eco-Drive parameter availability depend on selected data source. More information on his matter can be found in "Eco-Drive sources" chapter.

1. In the **IO events** section click on "Options" button. It opens up a new "IO settings" window.
2. You have many slots for parameters (40 for Eco4/4+/light/light+, Plug4 devices and 80 for Pro4, Tco4 HCV, Tco4 LCV devices). Select a slot that you want to enable (**If enable IO was selected in the previous part of the configuration, 7 IOs will already be enabled in the list**).
3. In the **IO properties** section tick the **Enable** check box, otherwise the slot will remain empty.
4. **ID** contains the parameters list. Choose an Eco-Drive parameter that you want to enable for the selected slot
5. Repeat steps 1 to 4 until you enable all Eco-Drive parameters. A list of all 11 parameters for the Eco-Drive from GPS functionality can be seen in picture below .
6. Once all parameters are enabled, close the "IO settings" window and send configuration to the device.

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Note

It is very important to enable at least one Eco-Drive parameter in the IO list. If you fail to do so, the ECO-Drive will not function.

Eco-Drive sources

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

FM Device side	Eco-Drive source
FM-Eco4/4+/light	ACC, GPS
FM-Plug4	ACC, OBD, OBD+ACC, GPS, GPS+OBD[1]
FM-Pro4	ACC, CAN, CAN+ACC, GPS, GPS+CAN[1]
FM-Tco4 LCV	ACC, CAN[2], CAN[2]+ACC, OBD, OBD+ACC, GPS, GPS+OBD[1], GPS+CAN[1]
FM-Tco4 HCV	ACC, CAN, CAN+ACC, OBD, OBD+ACC, GPS, GPS+OBD[1], GPS+CAN[1]

[1]Check change logs to see when this new data source was included in standard firmwares.
[2]Only for LCV source.

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.

Note
Cornering events do not work on TrustTrack system.

Some data sources has 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. Availability of parameters according to the Eco-Drive source is shown in table below:

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IO ID Parameter	Data source			
	CAN	Accelerometer	OBD	GPS
ECO absolute idling time	+	+	+	+
ECO brake counter	+	+	+	+
ECO cornering counter	CAN+ACC GPS+CAN[1]	+	OBD+ACC GPS+OBD[1]	+
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	+	+	+	+
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[3]	+	CAN+ACC	+	+
ECO acceleration value[3]	+	CAN+ACC	+	+
ECO cornering value[3]	CAN+ACC GPS+CAN[1]	CAN+ACC	OBD+ACC GPS+OBD[1]	+

[1]Check change logs to see when this new data source was included in standard firmwares.
[2]Only for LCV source.
[3]Parameters are only available in 4th generation (FM4) devices, also v1.1 Protocol version has to be used.

Note
Extended Eco-Drive parameters can be used only with FM-Tco4 HCV / LCV and FM-Pro4 devices.

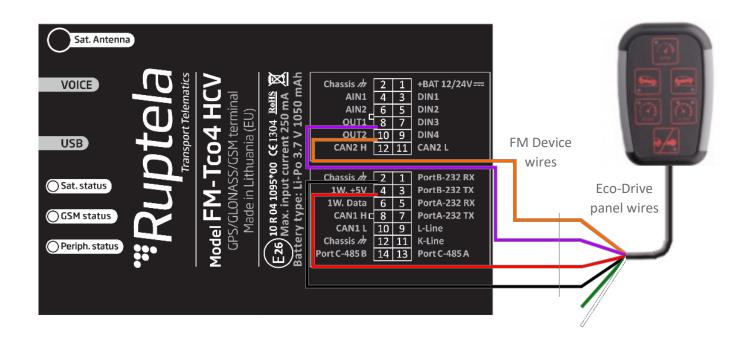## Eco-Drive panel connection to FM-Tco4 HCV, Tco4 LCV and FM-Pro4

FM-Tco4 HCV / FM-Tco4 LCV / FM-Pro4 Pinout

Wire colors (FM Device side)	Wire colors (Eco-Drive panel side)
Red - 1W +5V (in 14 pin connector)	Red
Black - GND (Chassis)	Black
Purple - DOUT1	Purple
Orange - DOUT2	Orange
	Green - To other device (if DOUT1 is needed)
	White - To other device (if DOUT2 is needed)

Note
Connection to 12V will damage the panel, connect it to +5V only!

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Eco-Drive panel connection to FM-Eco4 / 4+ and FM-Eco4 light/light+

FM-Eco4 / 4+ and FM-Eco4 light/ligh+ Pinout

Wire colors (FM Device side)	Wire colors (Eco-Drive panel side)
Red-White - 1W +5V (in 12 pin connector)	Red
Black - GND (Chassis)	Black
Purple - DOUT1	Purple
Orange - DOUT2	Orange
	Green - To other device (if DOUT1 is needed)
	White - To other device (if DOUT2 is needed)

Note

Connection to 12V will damage the panel, connect it to +5V only!

+BAT 12/24V⎓	Red
Chassis ⏚	Black
DIN1	Pink
DIN2	Blue
DIN3	White
DIN4	Yellow
AIN1	Grey
AIN2	Green
OUT1	Purple
OUT2	Orange
1-wire PWR	White / red
1-wire DATA	Green / yellow