

# CANbus filter by engine state

## Introduction

This feature allows to filter CANbus data by engine state. It helps solve errors in Eco-Drive data calculations, which arise from invalid CANbus data. Errors occur while the vehicle's ignition is being turned off and during a short time period, after it was turned on.

This functionality is available for the following FM devices with the newest firmware version:

- FM-Tco4 HCV
- FM-Tco4 LCV
- FM-Pro4

You can get the latest firmware and configurator from our documentation website: [doc.ruptela.lt](http://doc.ruptela.lt)

## Legal information

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## Document change log

Date	Version	Change details
2017-01-30	1.0	Initial draft.
2018-11-13	1.1	DXP CAN mode added to compatible mode list.

## CANbus filter

CANbus filtering is directly related to the vehicle's engine state. This functionality filters incorrect data, when the engine is off.

### Filter features

- When the filter is enabled, the device filters all data coming through its CAN interface. It means that instant CAN parameter values will be reset to 0 when engine state switches to "OFF". Therefore, all other FM device functionalities and internal tasks like Eco-Drive will not get invalid data.
- The filter has a configurable delay timer, which can be used when the engine's state changes to "ON". The device will not update CAN data during that time.
- You have the option to set a few exceptions. In the configurator you can allow the following parameters to pass through the filter unaffected:  
*CAN ignition, CAN engine speed, CAN wheel based speed, CAN fuel level milliliters, CAN fuel level1, CAN LCV doors state, CAN time and date.*
- CANbus filters do not affect tachograph data and tachograph parameters from the CANbus.

## Configuration

### CANbus filter configuration

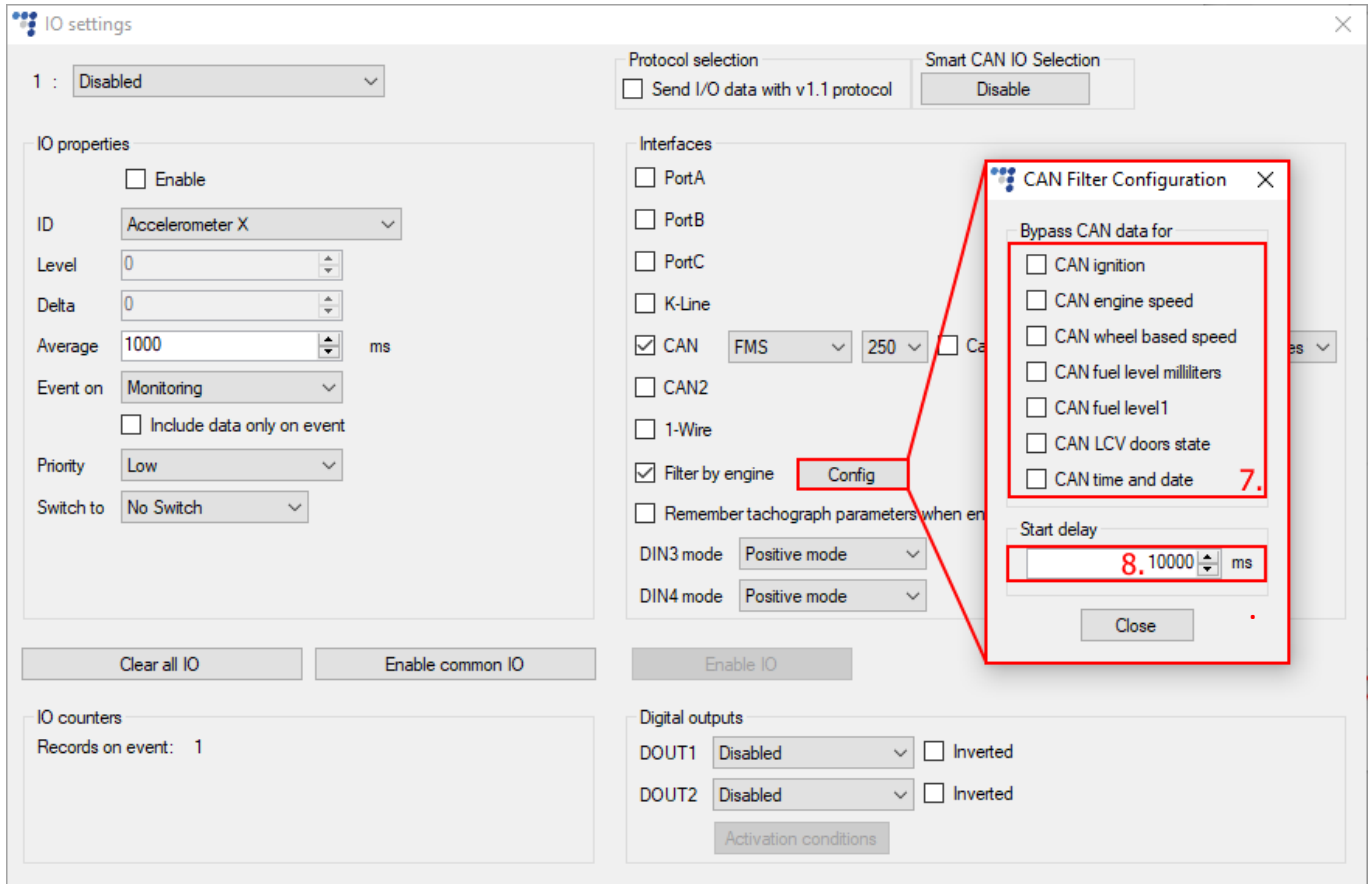
1. In the configurator select your device (*Tco4 LCV, Tco4 HCV, Pro4*).
2. In the **IO events** section, click the **Options** button. It opens up a new **IO settings** window.
3. In the **Interfaces** section, choose and enable one of the CAN interfaces.
4. In the drop-down list on the right select the CAN mode. CANbus filtering is compatible with the following modes: *FMS, HCV, LCV, DXP CAN*.
5. Tick the **Filter by engine** checkbox.
6. Click the **Config** button to access the CAN filter configuration window.

7. Select CAN parameters that will be able to bypass the CANbus filter. The values of these parameters will not be reset to 0 after the engine state changes to "OFF".

### Note

If *DXP CAN* mode is selected, no parameters can pass the filter. You will only be able to configure the delay timer.

- Set a start delay for the CANbus filter. It defines how long the device will not update CAN data after the engine state changes to "ON". The range is from 0 to 10000 ms.



### Enabling IO events

To receive data from your vehicle you must enable specific CANbus IO parameters. Data from all these parameters will be filtered.

- Some parameters can be selected only when v1.1 protocol is used. In the **Protocol selection** section, tick the **Send I/O data with v1.1 protocol** checkbox.
- Select a free slot for a new parameter that you want to enable.
- In the **IO properties** section tick the **Enable** checkbox, otherwise the slot will remain empty.
- ID** contains the parameters list. List of the most commonly used CANbus parameters:  
*CAN high resolution total vehicle distance, CAN engine total fuel used, CAN engine speed, CAN fuel level 1, CAN wheel based speed.*

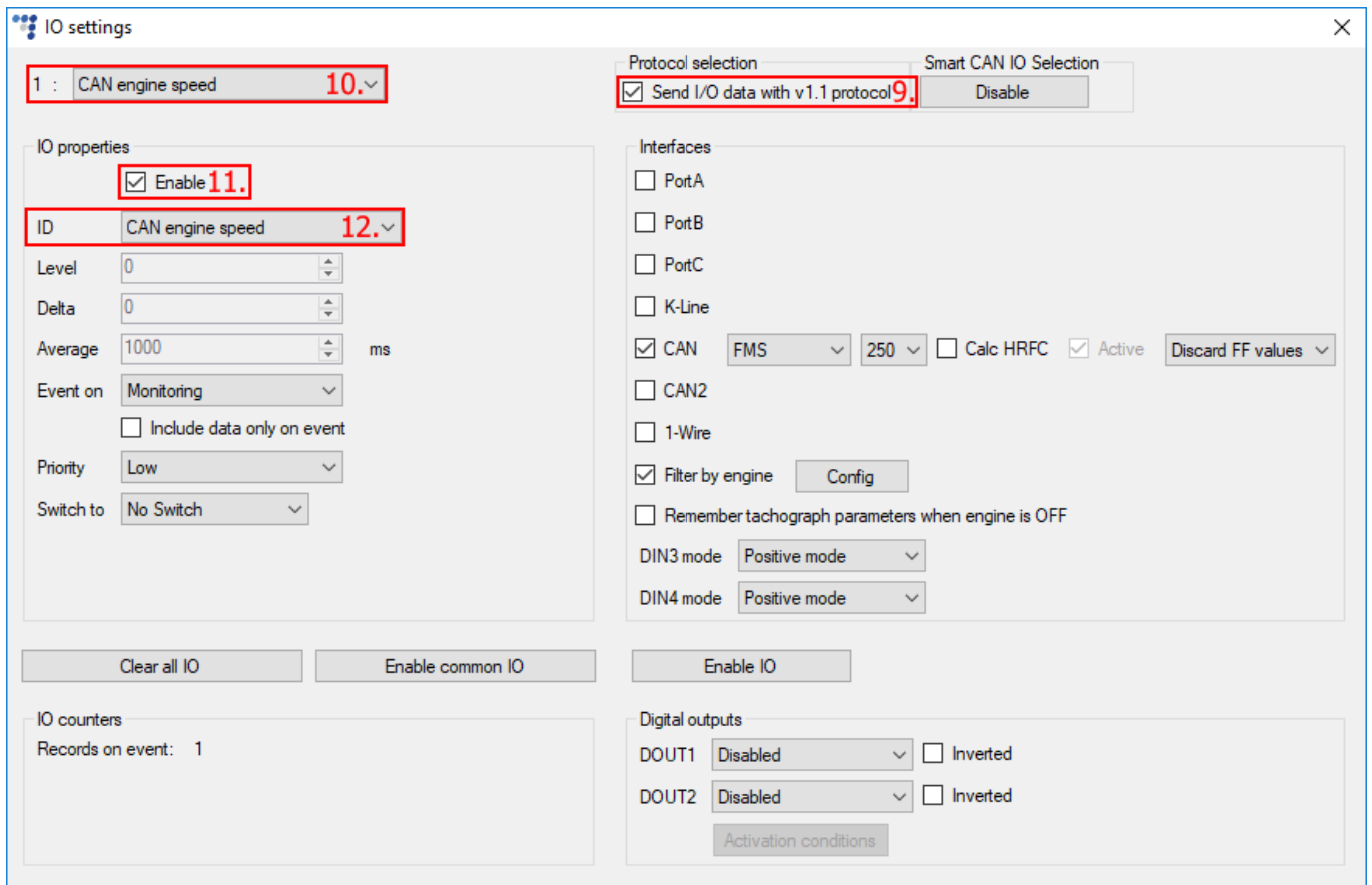
CANbus data filter can be bypassed by these IO parameters:

*CAN ignition, CAN engine speed, CAN wheel based speed, CAN fuel level milliliters, CAN fuel level1, CAN LCV doors state, CAN time and date.*

If you need their data, add them to the IO list.

### Note

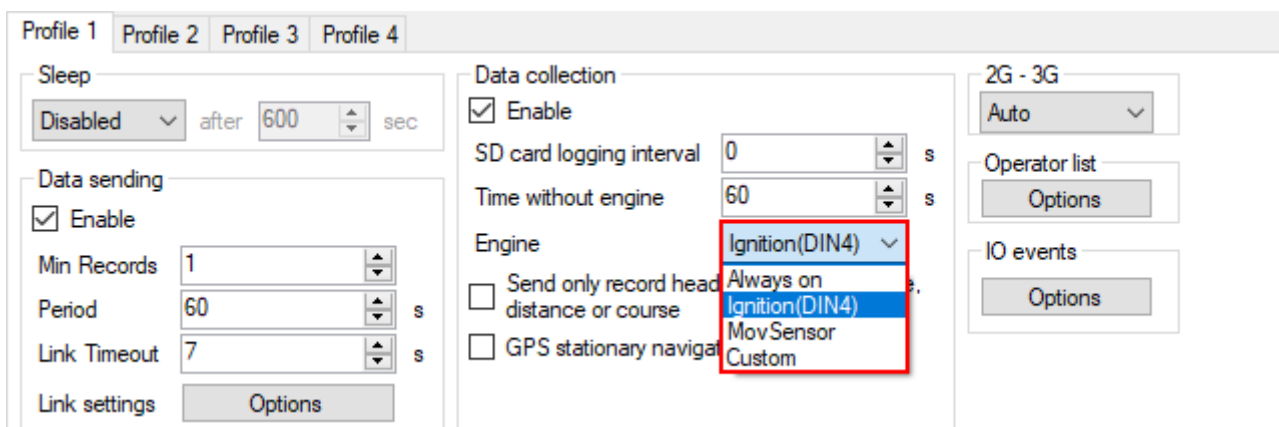
The IO list contains only those parameters that are compatible with currently selected CAN interface mode. If you want to see all parameters, use the Smart CAN IO Selection **Disable** button.



## Engine state detection

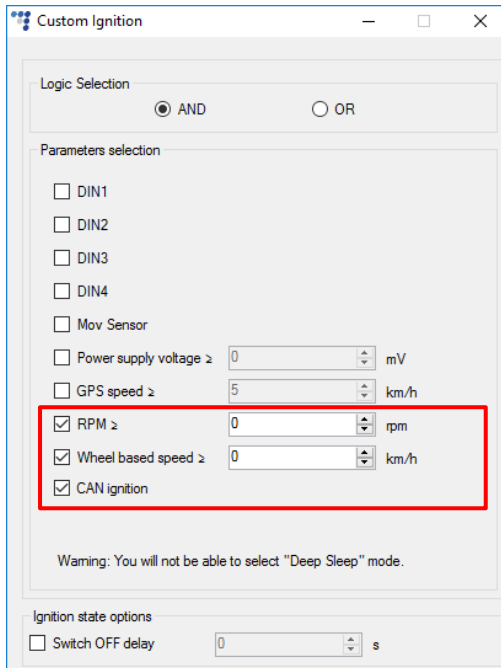
CANbus filtering is directly related to the vehicle's engine state. Engine state detection can be configured in the device's profile settings. In the **Engine** drop-down list select one of the available options:

- *Always on* – no ignition pickup, the engine is considered to always be on.
- *Ignition (DIN4)* – digital input 4 is default DIN used for ignition pick up.
- *MovSensor* – the engine is considered to be on when vehicle movements are detected.
- *Custom* – the custom ignition functionality allows the user to select more than one condition to detect engine ignition. The full functionality description can be found on our documentation website. Refer to the [Custom ignition](#) document.

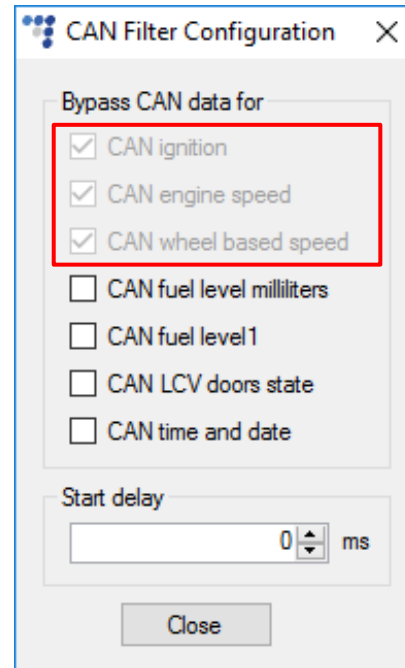


## Custom ignition configuration effect on CANbus filter options

If *RPM*, *Wheel based speed* or *CAN ignition* states are used as conditions for custom ignition, the same parameters will automatically bypass the CANbus data filter. In the filter options they will be enabled and greyed out.



The screenshot shows the 'Custom Ignition' configuration window. It features a 'Logic Selection' section with radio buttons for 'AND' (selected) and 'OR'. Below is a 'Parameters selection' section with several options: DIN1, DIN2, DIN3, DIN4, Mov Sensor, Power supply voltage ≥ (0 mV), GPS speed ≥ (5 km/h), RPM ≥ (0 rpm), Wheel based speed ≥ (0 km/h), and CAN ignition. The last three options are checked and highlighted with a red box. At the bottom, there is a 'Warning: You will not be able to select "Deep Sleep" mode.' and an 'Ignition state options' section with a 'Switch OFF delay' (0 s).



The screenshot shows the 'CAN Filter Configuration' window. It has a 'Bypass CAN data for' section with a list of options: CAN ignition, CAN engine speed, CAN wheel based speed, CAN fuel level milliliters, CAN fuel level1, CAN LCV doors state, and CAN time and date. The first three options are checked and highlighted with a red box. Below this is a 'Start delay' section with a numeric input field set to 0 ms. A 'Close' button is at the bottom.