



Custom Ignition User Manual

2018/11

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1. Introduction

The custom ignition functionality allows the user to select more than one condition to detect engine ignition.

This features description is applicable for these FM devices with the latest firmware version:

- FM-Tco4 HCV
- FM-Tco4 LCV
- FM-Pro4
- FM-Eco4
- FM-Eco4 S
- FM-Plug4

You can get the latest firmware and configurator from our documentation website: doc.ruptela.it

1.1 Legal information

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1.2 Document change log

Date	Version	Change details
2016-01-06	1.0	Initial draft.
2016-02-03	1.1	Hysteresis included in parameters description.
2016-10-26	1.2	Added "OR" condition into the Custom Ignition functionality.
2016-11-10	1.3	"Min. Active state duration" field in configurator renamed to "Switch OFF delay". Added operation examples.
2017-01-30	1.4	Added "CAN Ignition" check box in Custom Ignition parameters section
2017-06-29	1.5	Added note regarding not selecting any ignition triggers.
2018-11-15	1.6	Added configuration description for Plug4. Added "Custom sleep mode" description in "Sleep, Deep sleep and Interfaces". Added table showing available parameters for different FM devices in "Custom ignition IO parameter".

2. Functionality description

2.1 Custom ignition IO parameter

IO ID	Parameter name	Name in configurator	Size, B	Value range	Description
409	Custom ignition	Custom ignition	1	0 - 1	0 – off, 1 – on

The value of this parameter is based on the state of other IO parameters, which differ among devices:

Parameter	Tco4 HCV	Tco4 LCV	Pro4	Eco4	Eco4 S	Plug4
DIN1	+	+	+	+	+	
DIN2	+	+	+	+	+	
DIN3	+	+	+	+	+	
DIN4	+	+	+	+	+	
Mov Sensor	+	+	+	+	+	+
Power supply voltage	+	+	+	+	+	+
GPS speed	+	+	+	+	+	+
RPM	+	+	+			
Wheel based speed	+	+	+			
CAN ignition	+	+	+			
OBD PIN1						+

Note

RPM and **Wheel based speed** data is obtained from CAN, if it is not available, parameters will be taken from OBD.

During custom ignition configuration, a specific set of parameters are combined together. Combination means that a certain number of them have to be selected. This is done in configurator. More information on configuration procedure available in next chapter.

These parameters can be linked with a logical "AND" operation or a logical "OR" operation. User decides which should be used. By default "AND" is used.

All other functionalities work the same with Custom ignition (i.e. stationary navigation filtering) as they work with the normal ignition (DIN4).

Note

To enable "Custom ignition" parameter in the IO settings window extended protocol version v1.1 has to be used.

AND

This means that conditions for all selected parameters have to be satisfied. Only then the ignition will be considered to be on and the "Custom ignition" IO parameter will have value "1" - on.

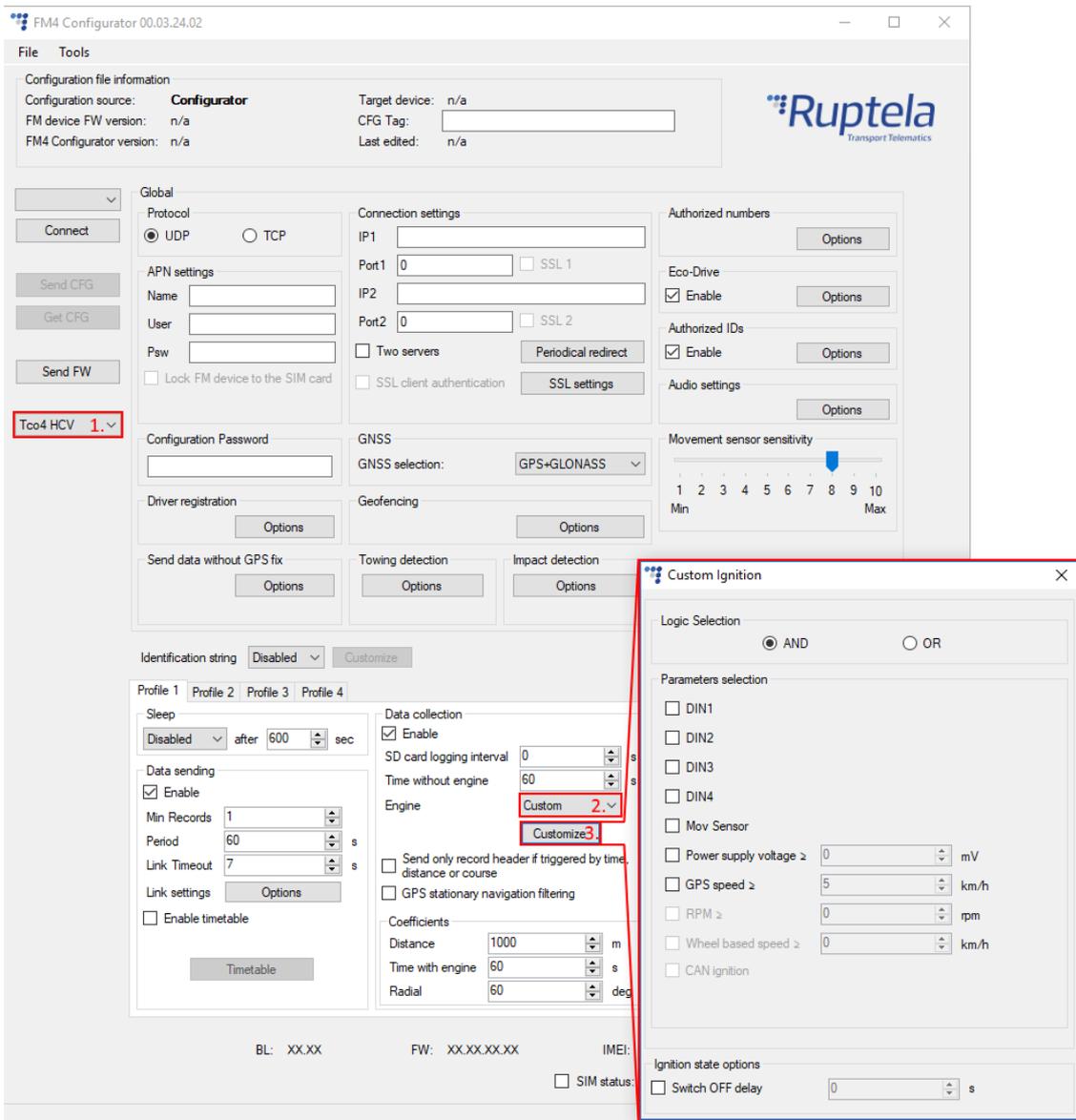
OR

Logical "OR" operation means that conditions for at least one of the selected parameters have to be satisfied. Only then the ignition will be considered to be on and the "Custom ignition" IO parameter will have value "1" - on.

2.2 Configuration for Tco4 LCV, Tco4 HCV, Pro4 or Eco4 Custom ignition configuration

The first part of the configuration deals with custom ignition parameters selection. Follow these steps to configure your FM device:

1. In the configurator select your device.
2. Under the profile settings, in the **Data collection** section locate the **Engine** dropdown menu and select *Custom*.
3. Once you click on the "Customize" button below, it opens up a new popup window called "Custom Ignition". Custom engine ignition pickup configuration is done here.



Note

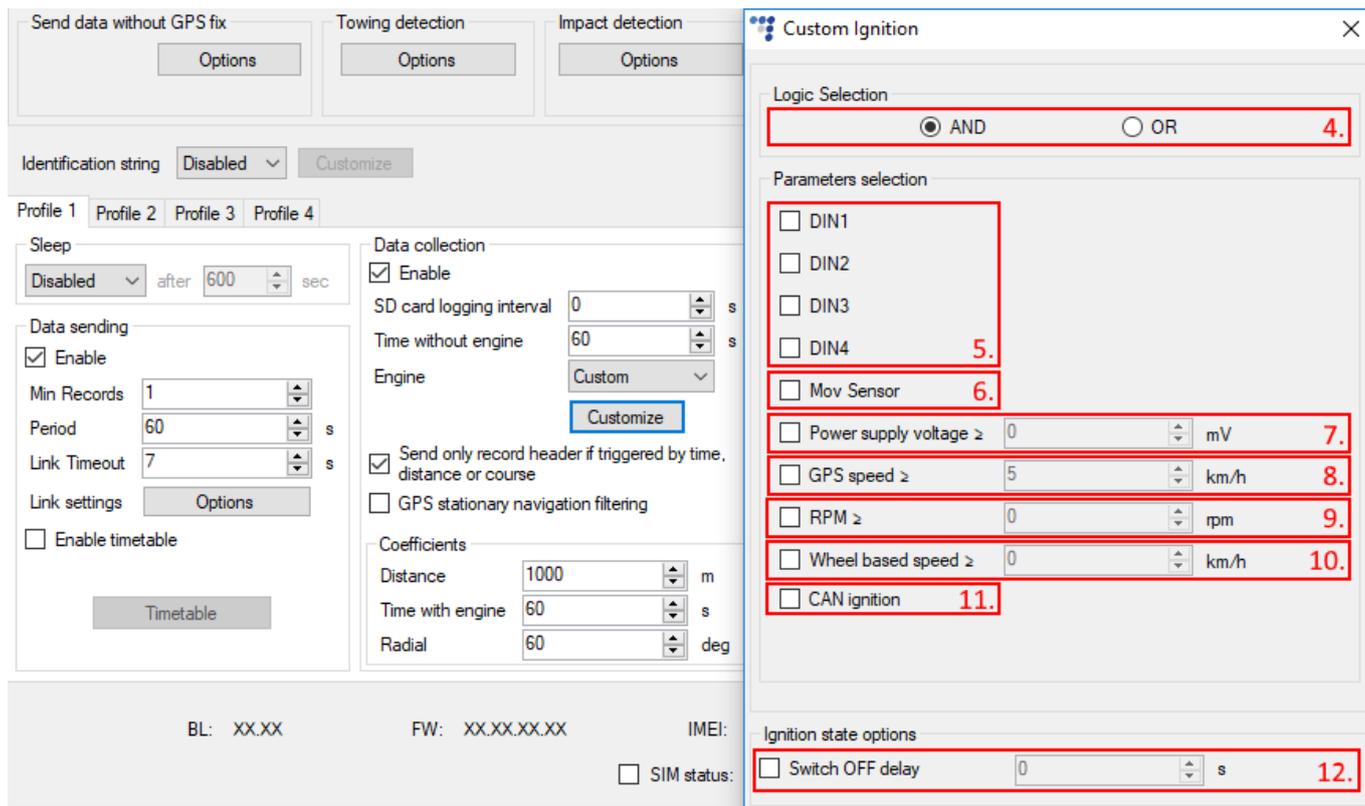
Custom ignition functionality also depends on interface configuration, which is done in the "IO settings" window, **Interfaces** section. **RPM**, **Wheel based speed** and **CAN ignition** sections in "Custom Ignition" window will be hidden, if **CAN: FMS/HCV/LCV** or **K-Line: OBD** is not enabled in the configurator.

Some data sources for parameters have an option to be enabled/disabled, other sources also have configurable threshold values. Detailed description available below.

4. **Logic selection** – for the custom ignition configuration a specific set of parameters have to be combined together. Available parameters are listed in the **Parameters selection** section. Combination means that a certain number of them have to be selected. These parameters can be linked with a logical "AND" operation or a logical "OR" operation.
5. **DIN1, DIN2, DIN3** and **DIN4** – ignition detection based on digital inputs states.
6. **Mov Sensor** – detect vehicle movement and consider engine to be on. Movement sensor sensitivity is configurable in the **Global** settings section.
7. **Power supply voltage** – voltage level in mV. Range from 0 mV to 65535 mV. When power supply voltage is greater than the value provided by the user this condition is considered to be "TRUE". Power supply voltage parameter has 250 mV hysteresis.
8. **GPS speed** – speed value in km/h, obtained from GPS. Range from 5 km/h to 255 km/h. When GPS speed is greater than the value provided by the user this condition is considered to be "TRUE". GPS speed parameter has 3 km/h hysteresis.
9. **RPM** – RPM's value, obtained from CAN data, if it is not available, then OBD data is used. Range from 0 rpm to 8031 rpm. When RPM value is greater than the value provided by the user this condition is considered to be "TRUE".
10. **Wheel based speed** – speed value in km/h, obtained from CAN data, if it is not available, then OBD data is used. Range from 0 km/h to 250 km/h. When wheel based speed is greater than the value provided by the user this condition is considered to be "TRUE". Wheel based speed parameter has 3 km/h hysteresis.
11. **CAN ignition** – in some cases CANbus data obtained from specific vehicles contain information about vehicle's ignition state. When CAN interface on the FM device is set into the FMS/HCV/LCV mode, this information could be read and used as custom ignition parameter.
12. **Switch OFF delay** – duration in seconds. Timer value range is from 1 to 65535 seconds. This timer keeps custom ignition active state for a defined time period after at least one of configured conditions become "FALSE".

Notes

- Power supply voltage, GPS speed and Wheel based speed parameters have hysteresis. This has to be taken into account during device configuration.
Operation example: Power supply voltage is set to 13000 mV. In this case, engine will be considered to be on only when power supply voltage is above 13250 mV. Engine will be considered to be off only when power supply voltage drops below 12750 mV.
- If the device receives an error value for RPM or Wheel based speed from both sources CAN and OBD, then the Boolean value for those parameters will be considered to be "FALSE". Therefore, the IO "Custom Ignition" will have value "0" - off.



Notes

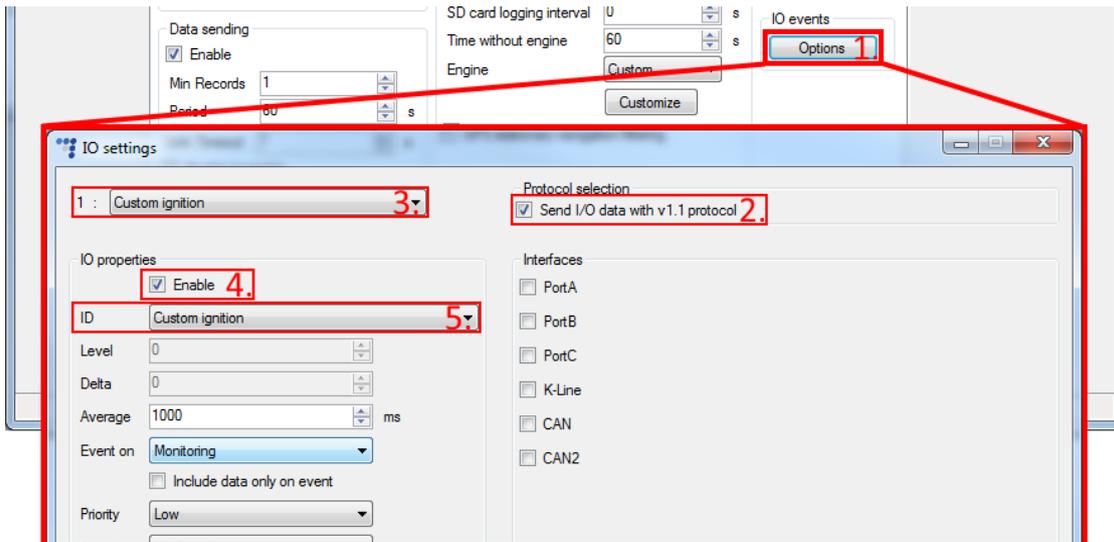
If none of the ignition triggers are selected, the ignition will always be registered as "Off".

Enable "Custom ignition" IO parameter

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

1. In the **IO events** section click on "Options" button. It opens up a new "IO settings" window.
2. "Custom ignition" parameter can be selected only when v1.1 protocol is used. In **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 *Custom ignition*.

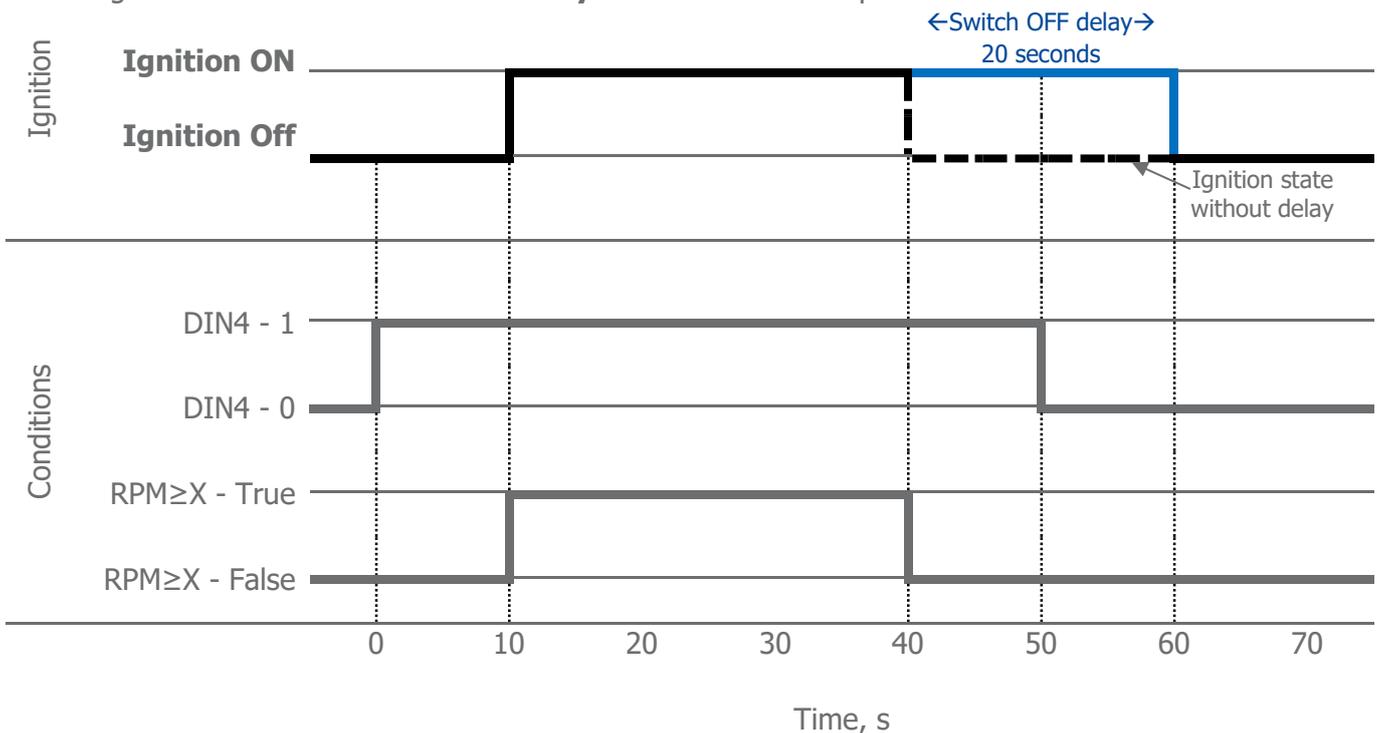
Once the parameter is enabled, close the "IO settings" window and send configuration to the device.



2.3 Operation examples

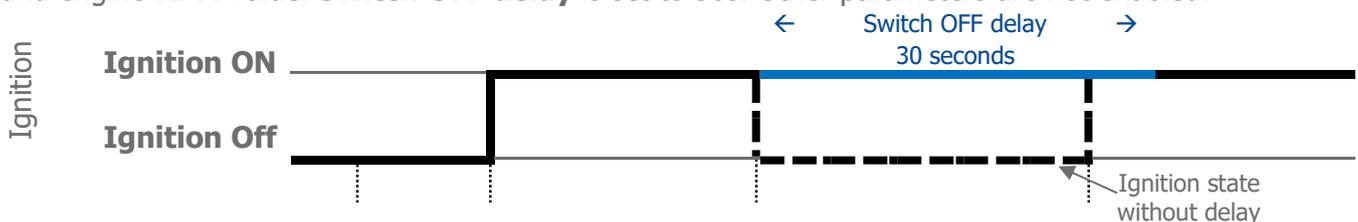
Case 1

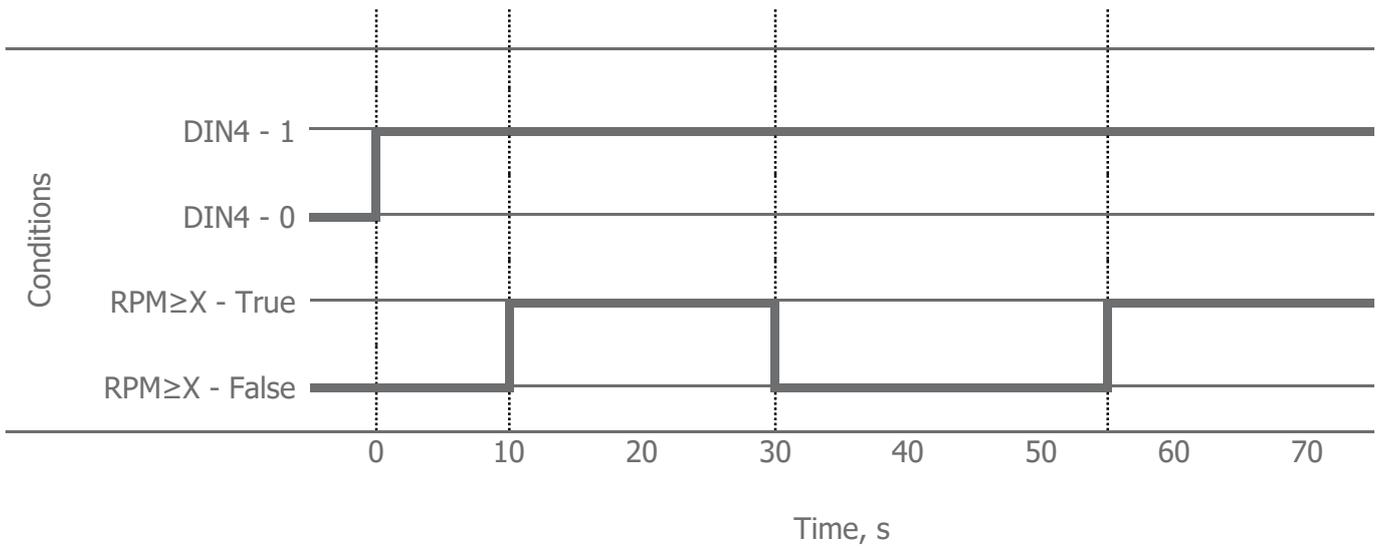
"AND" logic is used to combine custom ignition parameters. Ignition detection is based on **DIN4** state and engine **RPM** value. **Switch OFF delay** is set to 20s. Other parameters are not enabled.



Case 2

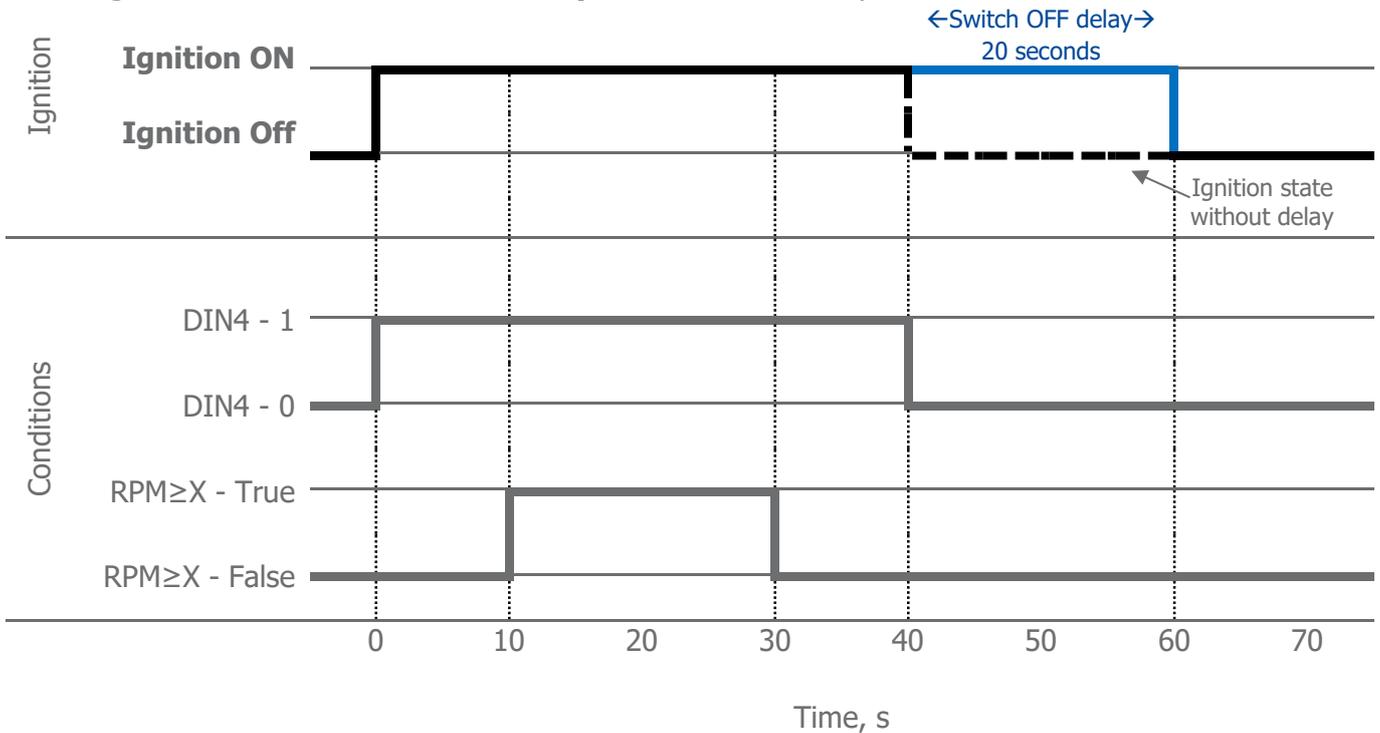
"AND" logic is used to combine custom ignition parameters. Ignition detection is based on **DIN4** state and engine **RPM** value. **Switch OFF delay** is set to 30s. Other parameters are not enabled.





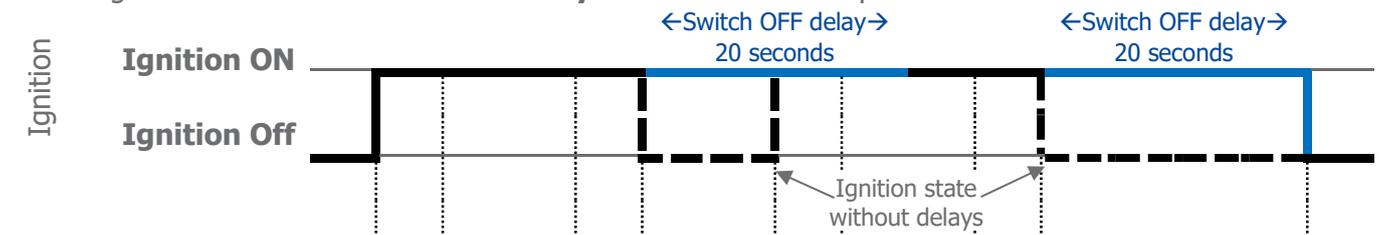
Case 3

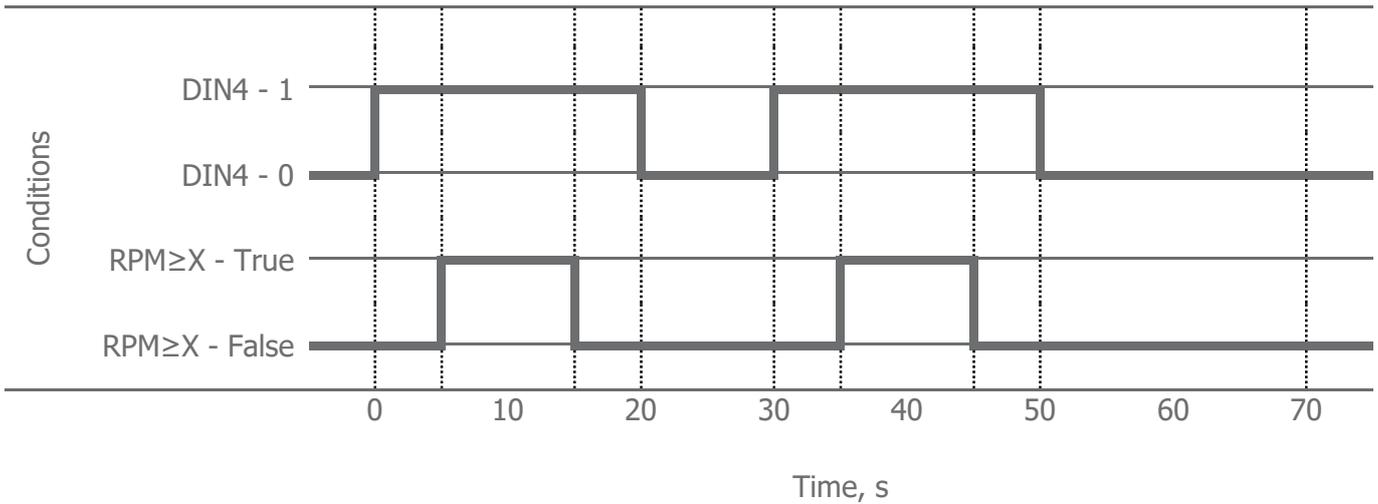
"OR" logic is used to combine custom ignition parameters. Ignition detection is based on **DIN4** state and engine **RPM** value. **Switch OFF delay** is set to 20s. Other parameters are not enabled.



Case 4

"OR" logic is used to combine custom ignition parameters. Ignition detection is based on **DIN4** state and engine **RPM** value. **Switch OFF delay** is set to 20s. Other parameters are not enabled.



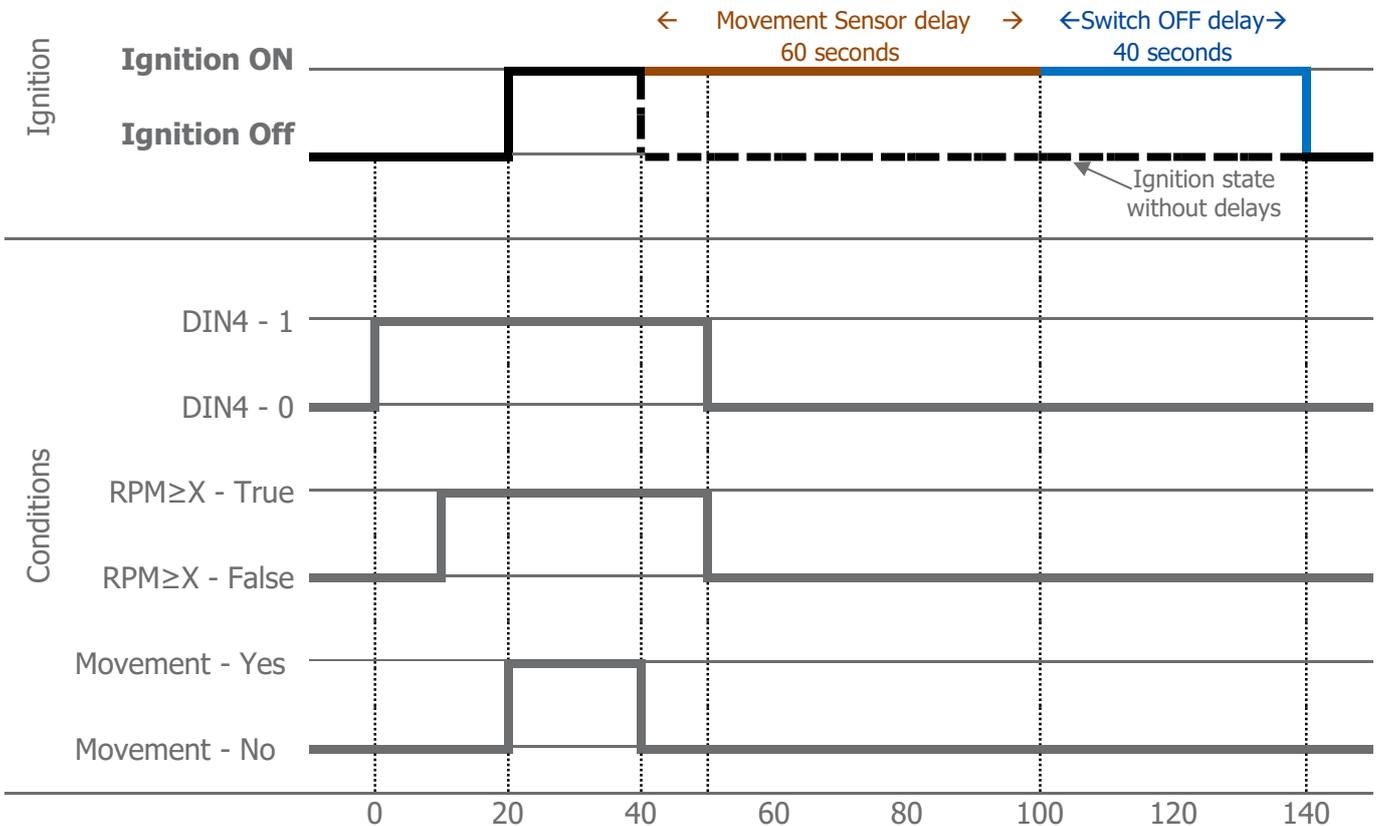


Case 5

"AND" logic is used to combine custom ignition parameters. Ignition detection is based on **DIN4** state, engine **RPM** value and **Mov Sensor** data. **Switch OFF delay** is set to 40s. Other parameters are not enabled.

Note

This is a special case, since Movement sensor is used in the ignition detection process. This adds an additional 60 seconds delay timer. After sensor no longer registers movement, this timer keeps custom ignition active ("ON") state for additional 60 seconds. Then, switch OFF delay timer (if it is configured) has to expire.



2.4 Configuration for Plug4

Custom ignition configuration

The first part of the configuration deals with custom ignition parameters selection. Follow these steps to configure your FM device:

1. In the configurator select *Plug4* device.
2. Under the profile settings, in the **Data collection** section locate the **Engine** dropdown menu and select *Custom*.
3. Once you click on the "Customize" button below, it opens up a new popup window called "Custom Ignition". Custom engine ignition pickup configuration is done here.

The screenshot shows the FM4 Configurator 00.03.24.02 interface. The main window has a menu bar with 'File' and 'Tools'. Below it is a 'Configuration file information' section with fields for 'Configuration source: Configurator', 'Target device: n/a', 'FM device FW version: n/a', 'CFG Tag: [input]', 'FM4 Configurator version: n/a', and 'Last edited: n/a'. The 'Ruptela Transport Telematics' logo is in the top right. The main configuration area is divided into several sections: 'Global' (Protocol: UDP selected), 'APN settings' (Name, User, Psw), 'Connection settings' (IP1, Port1, IP2, Port2, Two servers, Periodical redirect), 'Authorized numbers' (Options), 'Eco-Drive' (Enable checked), and 'Movement sensor sensitivity' (slider from 1 to 10). A sidebar on the left has buttons for 'Connect', 'Send CFG', 'Get CFG', 'Send FW', and a device selection dropdown showing 'Plug4' with a '1.' next to it. Below the sidebar are sections for 'Send data without GPS fix', 'Towing detection', 'Impact detection', and 'Identification string' (Disabled). The 'Profile 1' settings are visible, including 'Sleep' (Disabled after 600 sec), 'Data sending' (Enable checked, Min Records 1, Period 60, Link Timeout 7), and 'Data collection' (Enable checked, Time without engine 60, Engine dropdown set to 'Custom' with a '2.' next to it, and a 'Customize' button with a '3.' next to it). The 'Custom Ignition' popup window is open, showing 'Logic Selection' (AND selected), 'Parameters selection' (OBD PIN1, Mov Sensor, Power supply voltage > 0 mV, GPS speed > 5 km/h), and 'Ignition state options' (Switch OFF delay 0 s).

Note

Custom ignition functionality also depends on interface configuration, which is done in the "IO settings" window, **Interfaces** section.

Some data sources for parameters have an option to be enabled/disabled, other sources also have configurable threshold values. Detailed description available below.

4. **Logic selection** – for the custom ignition configuration a specific set of parameters have to be combined together. Available parameters are listed in the **Parameters selection** section. Combination means that a certain number of them have to be selected. These parameters can be linked with a logical “AND” operation or a logical “OR” operation.
5. **OBD PIN 1** – ignition detection based on signal state of OBD PIN 1.
6. **Mov Sensor** – detect vehicle movement and consider engine to be on. Movement sensor sensitivity is configurable in the **Global** settings section.
7. **Power supply voltage** – voltage level in mV. Range from 0 mV to 65535 mV. When power supply voltage is greater than the value provided by the user this condition is considered to be “TRUE”. Power supply voltage parameter has 250 mV hysteresis.
8. **GPS speed** – speed value in km/h, obtained from GPS. Range from 5 km/h to 255 km/h. When GPS speed is greater than the value provided by the user this condition is considered to be “TRUE”. GPS speed parameter has 3 km/h hysteresis.
9. **Switch OFF delay** – duration in seconds. Timer value range is from 1 to 65535 seconds. This timer keeps custom ignition active state for a defined time period after at least one of configured conditions become “FALSE”.

Notes

- Power supply voltage, GPS speed parameters have hysteresis. This has to be taken into account during device configuration.

Operation example: Power supply voltage is set to 13000 mV. In this case, engine will be considered to be on only when power supply voltage is above 13250 mV. Engine will be considered to be off only when power supply voltage drops below 12750 mV.

Notes

If none of the ignition triggers are selected, the ignition will always be registered as “Off”.

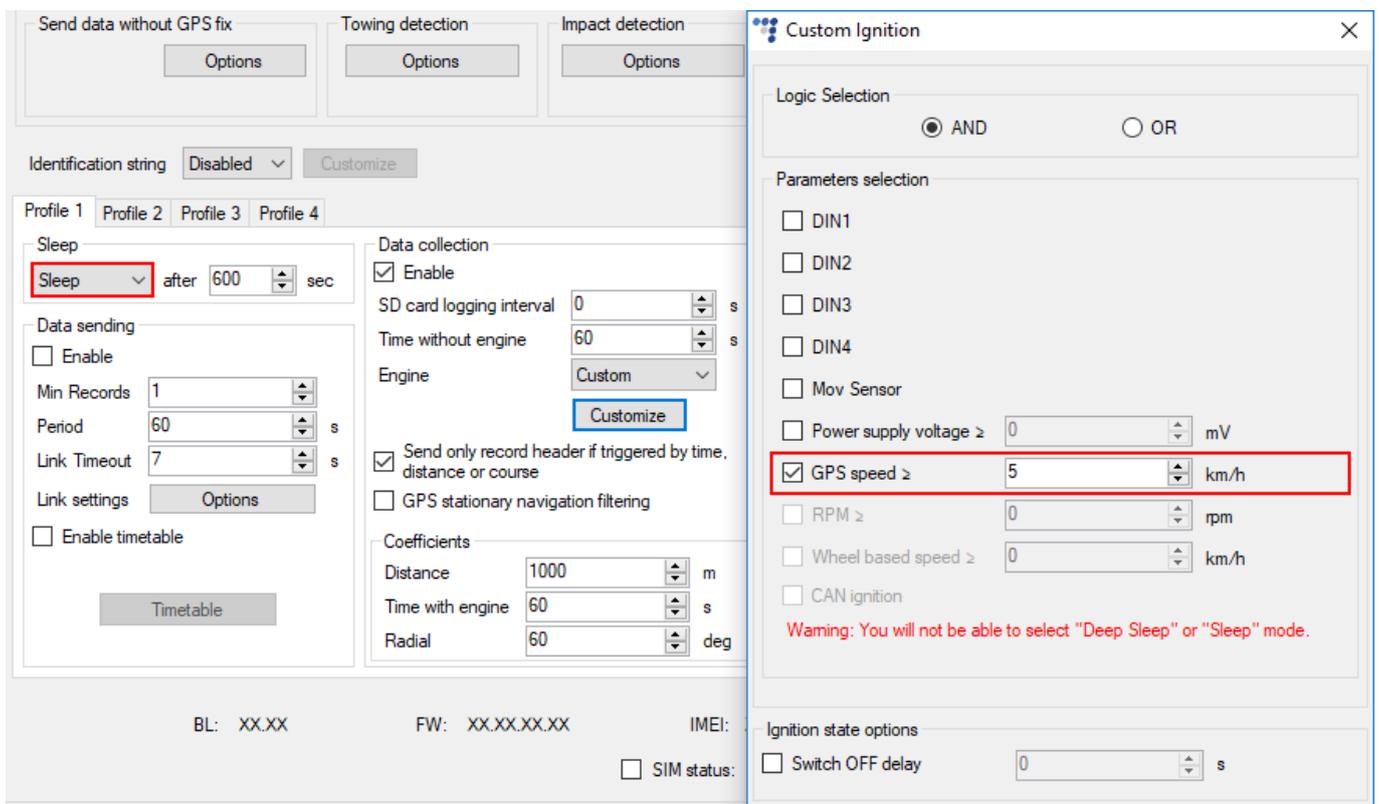
Enable "Custom ignition" IO parameter

In order to see the "Custom ignition" parameter in reports you have to enable it in the **IO settings** window as described in [Configuration for Tco4 LCV, Tco4 HCV, Pro4 or Eco4](#) (page 7).

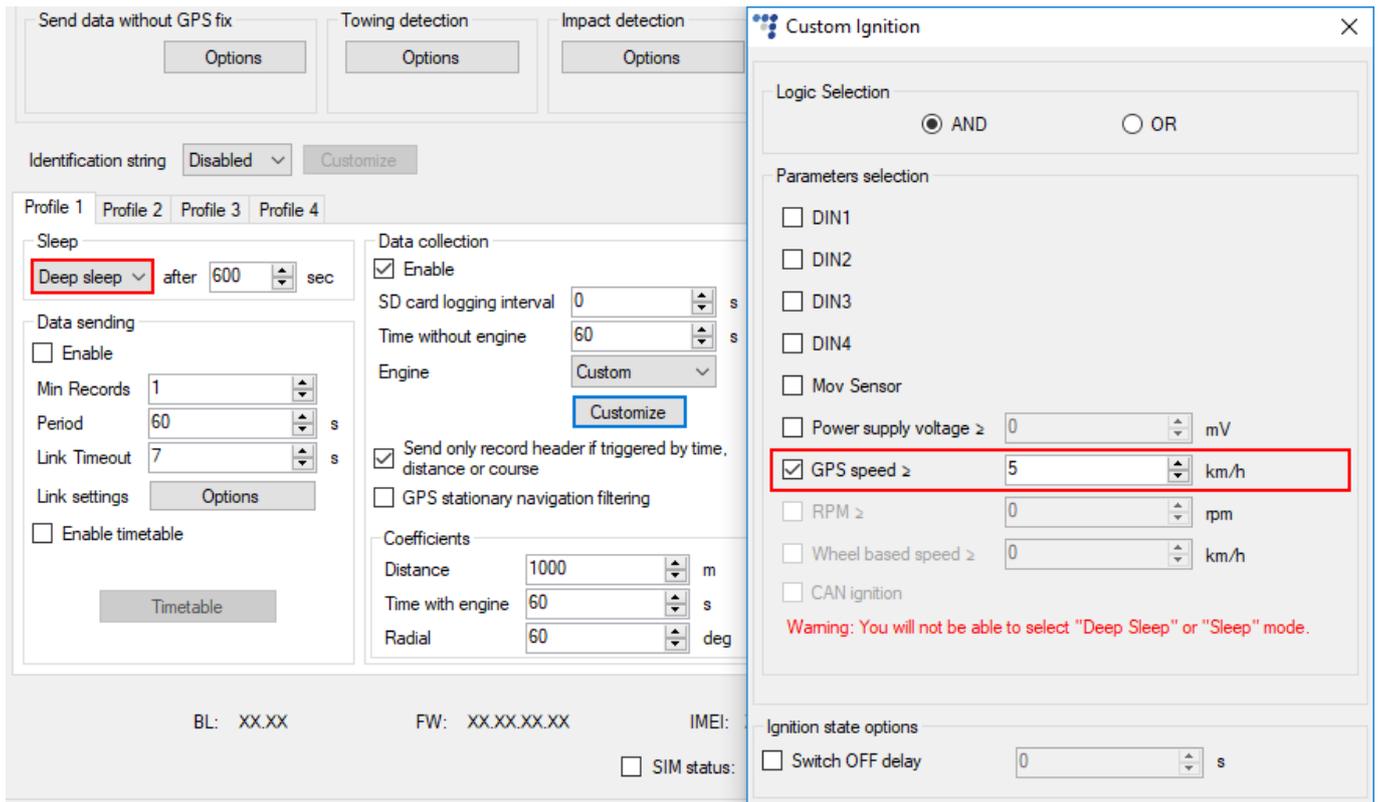
2.5. Sleep, Deep sleep and Interfaces

Custom ignition functionality depends on sleep mode configuration, which is done under Profile settings in **Sleep** section. There are two cases to consider:

- *Sleep* mode is selected. GPS/GSM modems will be disabled, when device transitions into sleep mode. Therefore, data from GPS will not be available and selecting **GPS speed** check box will automatically disable *Deep sleep* mode. You will be notified about this with the warning message at the bottom of the window.

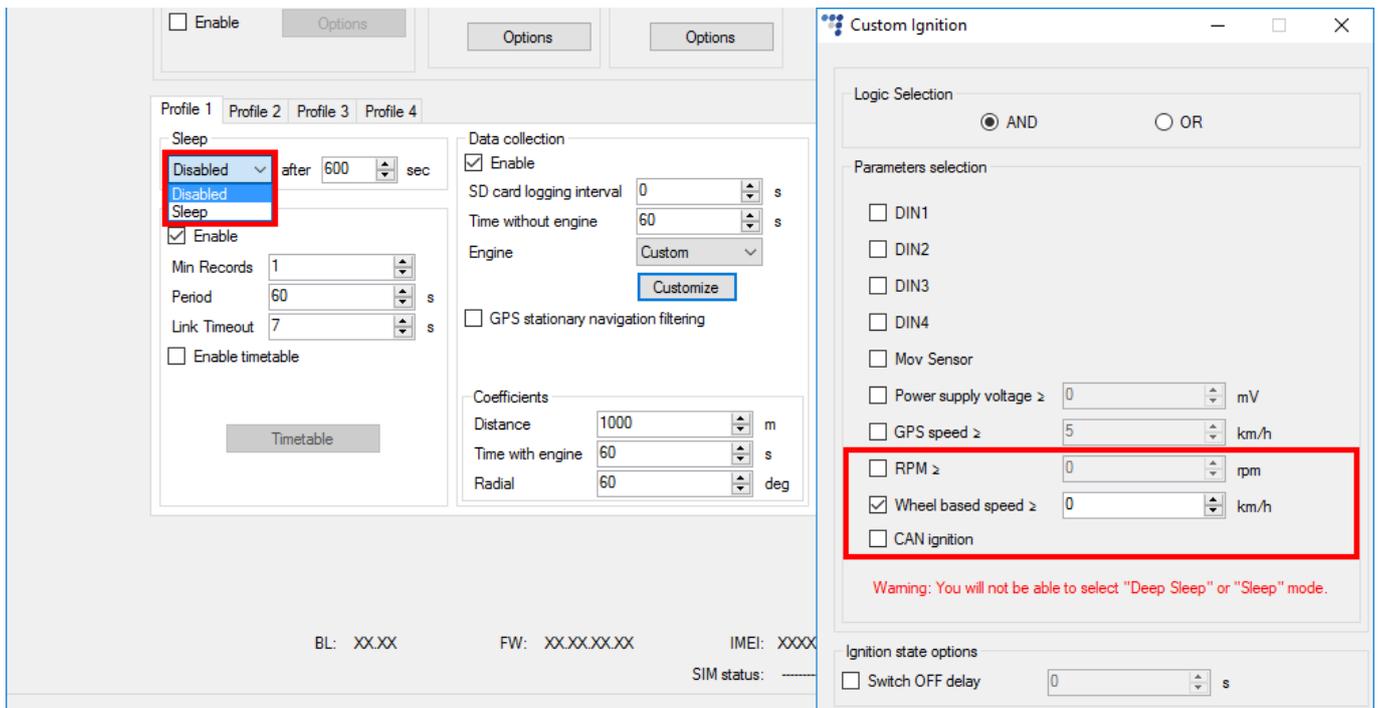


- *Deep sleep* mode is selected. **RPM**, **Wheel based speed** and **CAN ignition** check boxes in "Custom Ignition" window will be greyed out. Selecting **GPS speed** check box will automatically disable *Deep sleep* mode. Warning message will appear at the bottom of the window.

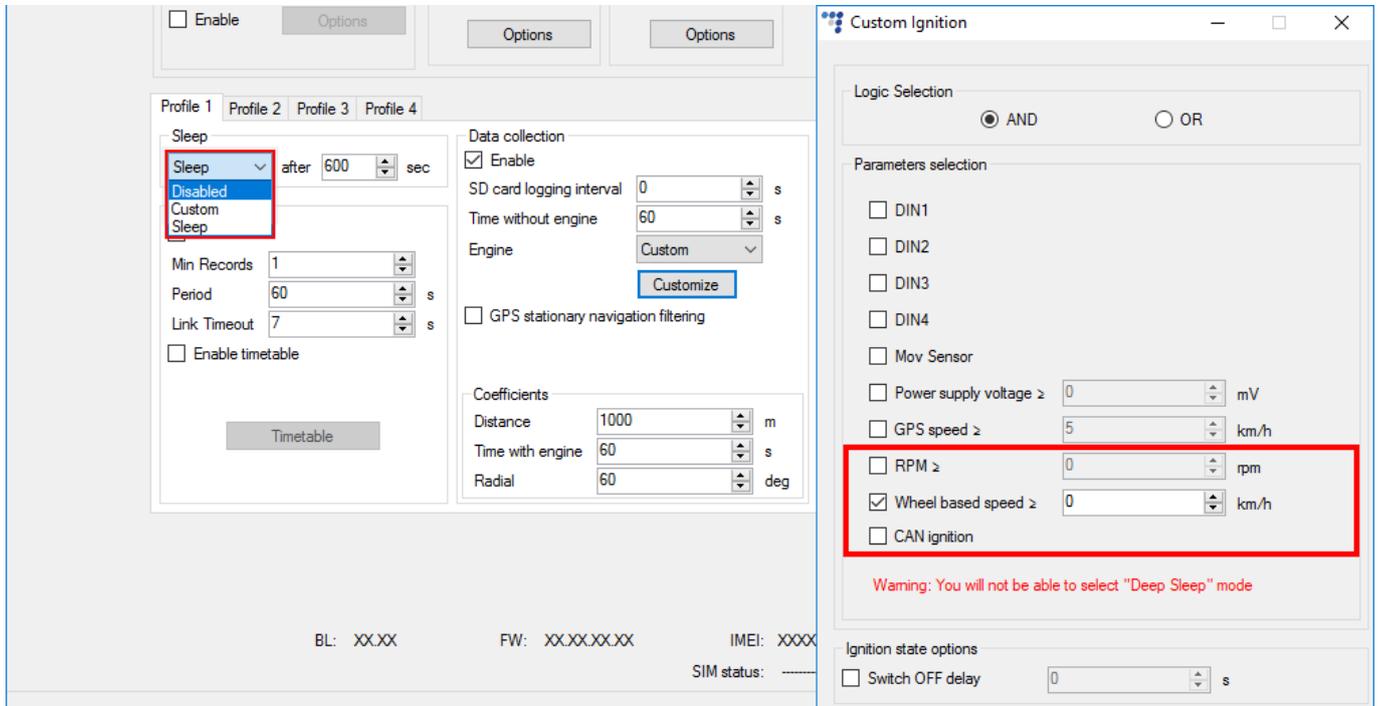


On the other hand, if “Custom Ignition” configuration is done beforehand, it affects sleep mode configuration options:

- **GPS speed** field is enabled in “Custom Ignition” settings. In this case it is not possible to select *Sleep* and *Deep sleep* modes in **Sleep** section. Also, a warning message will be displayed at the bottom of the “Custom Ignition” window.



- If at least one of **RPM**, **Wheel based speed** or **CAN ignition** fields are enabled in the “Custom Ignition” settings. In this case it is not possible to select *Deep sleep* mode in **Sleep** section. Also a warning message will be displayed at the bottom of the “Custom Ignition” window: “You will not be able to select “Deep Sleep” mode”.



- *Custom sleep* mode is selected. The availability of parameters selection in “Custom Ignition” window will depend on configured functionalities. The full *Custom sleep* description can be found on our documentation website, [Configurable sleep](#).