



# Advanced Configurator User Manual



**Revision:** 1.31v

**Date:** 2024-03

## Table of Contents

Table of Contents .....	1
1. Advanced Configurator User Manual .....	2
1.1 Prerequisites .....	9
1.2 About the Advanced Configurator.....	11
1.3 Device Communication.....	21
1.4 Driver Registration and Authorization.....	40
1.5 Trip Type Detection .....	42
1.6 Eco-Drive.....	44
1.7 Vehicle Movement.....	45
1.8 Profile Settings.....	55
1.9 IO Parameters.....	68
1.10 Peripherals and Interfaces.....	73
1.11 SMS Commands and Settings .....	111
1.12 Finishing the Configuration .....	115
1.13 Updating the Firmware.....	116

# 1. Advanced Configurator User Manual

## Purpose of This Document

The purpose of this user manual is to provide information about the advanced configurator. This user manual describes the main features of the advanced configurator and how to use it.

## Document Application

The advanced configurator can be used with all 4<sup>th</sup> and 5<sup>th</sup> generation tracking devices and all computers with a Windows 10/11 operating system.

## Document Changelog

Version	Date	Modification
1.31	2024-03-08	Added: Eco5 Updated: Changelog
1.30	2024-01-25	Added: BLE API. Added: CAN Autoconfiguration. Updated: Devices Compatibility. Updated: Peripherals and interfaces.
1.29	2023-12-12	Added: Plug5. Added: Data collection - Auto Ignition. Updated: Formatting.
1.28	2023-07-17	Added: Auth type selection in APN settings for HCV5 Lite/Pro5 Lite devices.
1.27	2022-09-16	Updated: Geofencing and Auto-Geofencing. Updated: Peripherals and Interfaces.
1.26	2022-08-05	Updated: Driver Registration and Authorization. Updated: Eco-Drive.

		Updated: Vehicle Movement.
1.25	2022-07-15	Updated: Wireless.
1.24	2022-06-28	Added: Additional explanation for the Hysteresis mode in IO. Parameters.
1.23	2022-05-20	New device: HCV5 Lite/Pro5 Lite.
1.22	2022-02-18	<p>Added: Trace5-LTE device support related information.</p> <p>Updated: File Extensions.</p> <p>Updated: DMP Settings.</p> <p>Updated: Device Communication.</p> <p>Updated: Assisted GNSS.</p> <p>Updated: Geofencing.</p> <p>Updated: Cellular Networks.</p>
1.21	2022-01-14	Added: Advanced Sleep mode description.
1.20	2021-11-05	<p>Updated: SSL Authentication.</p> <p>Updated: DNS Settings.</p> <p>Updated: DMP Settings.</p> <p>Updated: Assisted GNSS.</p> <p>Updated: Eco-Drive.</p> <p>Updated: Geofencing.</p> <p>Updated: Auto-Geofencing.</p> <p>Updated: Towing Detection.</p> <p>Updated: Impact and Rollover Detection.</p> <p>Updated: Digital Outputs.</p> <p>Updated: Firmware File Extensions.</p>
1.19	2021-04-23	<p>Added: DMP Settings.</p> <p>Updated: Configuration File Extensions.</p> <p>Updated: Additional CAN Mode Parameters.</p> <p>Updated: Firmware File Extensions.</p>
1.18	2021-02-12	Updated: Legal Information.

		Updated: Additional CAN Mode Parameters. Updated: Prerequisites.
1.17	2020-12-18	Updated: GSM/UMTS/LTE Cat M1 Network. Updated: GNSS Antenna Selection. Updated: Updating the Firmware.
1.16	2020-11-27	Added: DNS Settings. Added: Advanced CAN Options. Updated: Connection Settings. Updated: Identification String. Updated: Additional CAN Mode Parameters. Updated: Manufacturer Specific OBD Data Reading. Updated: Light Commercial Vehicle Configuration.
1.15	2020-11-06	Updated: Data collection. Updated: Identification String.
1.14	2020-10-16	Added: Updating Firmware using .fwp Pack Added: Menu toolbar: Help. Updated: Firmware File Extensions. Updated: Menu toolbar: Tools. Updated: Wireless.
1.13	2020-09-25	Added: Trip Type Detection. Added: GSM/LTE Cat M1/NB-IoT Network. Updated: Configuration File Extensions. Updated: Manufacturer Specific OBD Data Reading. Updated: Updating Firmware Manually. Updated: Connected Device Information.
1.12	2020-08-10	Updated: Data sending.

		Updated: Wireless.
1.11	2020-08-05	Updated: Configuration Files Extensions. Updated: Serial Port Interfaces.
1.10	2020-07-16	New devices: HCV5, LCV5, Pro5. Removed: New CFG Wizard. Added: GNSS Antenna Selection. Added: Wireless. Updated: Data sending. Updated: Cellular Network Settings.
1.9	2020-06-08	Updated: Data sending.
1.8	2020-05-15	Updated: Assisted GNSS. Updated: Two Servers.
1.7	2020-04-07	New device: Trace5. Added: Assisted GNSS. Updated: Accident Detection. Updated: SMS alerts.
1.6	2020-02-21	New device: FM-Eco4 T. Updated: Launching procedure in About the Advanced Configurator.
1.5	2020-01-10	Updated: GNSS.
1.4	2019-12-18	Updated: GNSS.
1.3	2019-12-03	Updated: Data Sending.
1.2	2019-11-08	Added: Auto-geofencing.
1.1	2019-10-28	Updated: GNSS.
1.0	2019-10-10	Initial draft.

## Safety Information

The following information is provided to ensure safe operation of the device. Please read it carefully before you start using the device!



The configuration must be performed using a 2nd safety class computer (with an autonomic power supply).



For configuration use cables that were purchased from Ruptela. Ruptela is not responsible for any harm or damage caused while using the wrong cables.



This crossed-out wheeled bin symbol means that waste equipment should not be disposed of with your other household waste. The product must be taken to separate collection points at the product's end-of-life.

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

### **Caution**



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

### **Warning**



Used to mark actions that may cause irreversible damage if performed incorrectly.

### **Tip**



Suggestions on how to proceed.

## Availability table

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✗	✗	✗

Used to mark which devices support a given functionality. 4<sup>th</sup> generation device names are written without the FM prefix.

## Acronyms and Abbreviations

AIN – Analog Input

APN – Access Point Name

ATH – Anti-Theft Hardware

CAN – Controller Area Network

CFG – Configuration File

CHAP – Challenge Handshake Authentication Protocol

DIN – Digital Input

DNS – Domain Name System

DOUT – Digital Output

DTC – Diagnostic Trouble Code

FM – Fleet Management

FMS – Fleet Management System

FW – Firmware

ICCID – Integrated Circuit Card Identifier

IO – Input/Output

GLONASS – GLObal NAVigation Satellite System

GNSS – Global Navigation Satellite System

GPRS – General Packet Radio Service

GPS – Global Positioning System



GSM – Global System for Mobile Communications (2G)

LTE – Long-Term Evolution

OCSP – Online Certificate Status Protocol

OBD – On-board Diagnostics

PAP – Password Authentication Protocol

RPM – Revolutions per Minute

SIM – Subscriber Identity Module

SMS – Short Message Service

SSL – Secure Sockets Layer

TCP – Transmission Control Protocol

UDP – User Datagram Protocol

UMTS – Universal Mobile Telecommunications Systems (3G)

USB – Universal Serial Bus

VCOM – Virtual Communication Port

## References

Device Center: <https://doc.ruptela.com/articles/#!downloads-publication/device-center>

Virtual COM Port drivers: <https://doc.ruptela.com/articles/#!downloads-publication/tracking-device-drivers>

Microsoft Framework: <https://dotnet.microsoft.com/download/dotnet-framework/net48>

User manuals: <https://doc.ruptela.com/articles/#!tracking-devices-publication/tracking-devices-home>

## 1.1 Prerequisites

Before configuring the device, install the following:

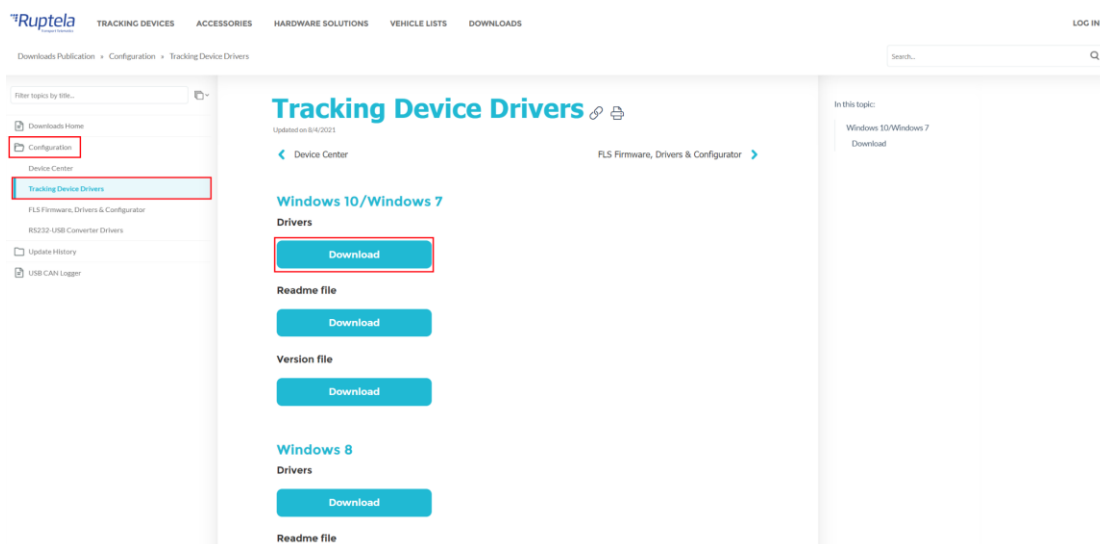
- The latest version of the [Device Center](#)
- The latest version of the [Microsoft Framework](#)
- [Virtual COM Port drivers](#)



Only Windows 10/11 operating systems are supported.



We recommend using a resolution of at least 1440x900 for optimal viewing.



Follow these steps to install the VCOM drivers:

1. Uninstall any previous VCOM drivers:
  - Windows 7: **Start -> Settings -> Control Panel -> Add or remove programs**
  - Windows 8: **Start -> Settings -> Control Panel -> Programs -> Programs and Features**
  - Windows 10/11: **Start -> Settings -> Apps -> Apps & features**
2. Extract the downloaded driver archive to your desired location. Launch the appropriate installation file for your operating system:
  - 32-bit operating system: launch **dpinst\_x86.exe**
  - 64-bit operating system: launch **dpinst\_amd64.exe**

3. Follow the instructions in the installation wizard. Once it is finished, the drivers are installed and operational.

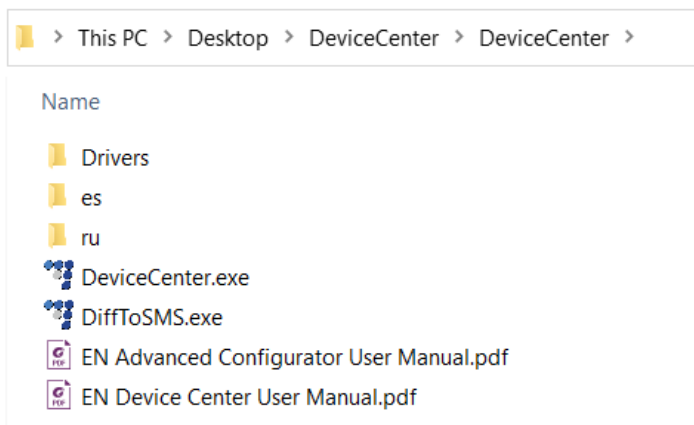
## 1.2 About the Advanced Configurator

The advanced configurator is used to configure Ruptela tracking devices and all their functionalities, allowing you to find the best solution for your needs. The advanced configurator allows you to do the following:

- Make a new configuration file
- Edit an existing configuration file
- Send a configuration file to your device
- Load an existing configuration file from your device
- Modify all device functionalities
- Update the device firmware

## Launching the Advanced Configurator

The advanced configurator is contained within the Device Center application. Extract the downloaded Device Center archive to your desired location. Launch **DeviceCenter.exe**.



Switch to the advanced configurator by clicking **Advanced mode** in the top bar.



## Configuration File Extensions

HCV5: **.ft5c**

LCV5: **.fl5c**

Pro5: **.fp5c**

HCV5 Lite/Pro5 Lite: **.fg5c**

Trace5-LTM (pre-revision): **.fa5c**

Trace5 NA: **.fb5c**

Trace5 (all other variants): **.fd5c**

Plug5: **.fe5c**

Eco5: **.fy5c**

FM-Tco4 HCV: **.ft4c**

FM-Tco4 LCV: **.fl4c**

FM-Pro4: **.fp4c**

FM-Eco4: **.fe4c**

FM-Eco4 S: **.fk4c**

FM-Eco4 T: **.fk4c**

FM-Eco4 RS T: **.fj4c**

FM-Plug4: **.fo4c**

## Advanced Configurator Overview

The main device configurator window has the following main sections:

1. Menu toolbar
2. Configuration file information
3. Interaction with the device – used to load/send configuration and firmware files
4. Connected device information
5. Configuration settings

## Menu toolbar: File

The menu toolbar contains two drop-down lists – **File** and **Tools**. When **File** is clicked, the following configuration file actions are displayed in the drop-down list:

New CFG	Resets the current configuration and begins the creation of a new configuration.
Open default CFG	Loads a default configuration with predefined values.
Save CFG	Saves the configuration file.

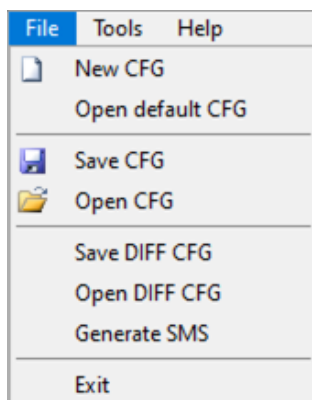
Open CFG	Loads a preset configuration file.
Save DIFF CFG	Creates a DIFF file which is used to change only one or a few certain parameters without a need to upload the full configuration to the device. It is useful when updating devices over-the-air.
Open DIFF CFG	Opens a saved DIFF configuration file.
Generate SMS	Generates an SMS command to configure the FM device remotely.  More information: <a href="#">Device Configuration via SMS</a>
Exit	Closes the advanced configurator.



**Save DIFF CFG** will only save changes made to the initial configuration (a loaded preset configuration).



If you click **Exit**, the configurator will close without any prior confirmation and the configuration will not be saved.

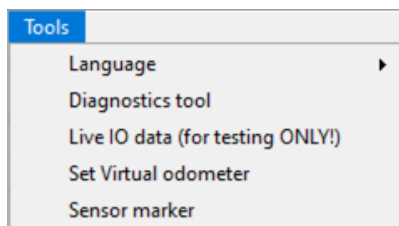


## Menu toolbar: Tools

When the **Tools** menu is opened, the following options are displayed in the drop-down list:

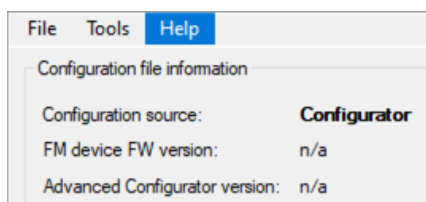
Language	Select the language. English and Russian are available.
Diagnostic tool	Only applicable for the 4 <sup>th</sup> generation devices. Opens a window where you can troubleshoot your tracking device.
Live IO data	Opens a window where all enabled inputs and outputs and their current parameter values are listed.
Set Virtual odometer	Opens a window where you can set a new value for the virtual odometer (in meters).

Sensor marker	Opens a window where you can mark your temperature and humidity sensors.
---------------	--



## Menu toolbar: Help

If you need some help with the advanced configurator, click **Help** to open the latest user manual.



## Configuration File Information


The configurator displays additional information about the loaded configuration file. The following information will be displayed at the top of the configurator once the configuration is loaded:

Configuration source	From where the configuration was loaded: <ul style="list-style-type: none"> <li><b>Configurator</b> – the configuration was loaded from a file</li> <li><b>Device [IMEI]</b> – the configuration was loaded from the device</li> </ul>
FM device FW version	The current device firmware version. Displayed only if the configuration was loaded from the device.
Advanced Configurator version	The configurator version on which the currently loaded configuration was made.
Target device	The FM device model for which this configuration was created or from which device it was loaded.
CFG Tag	An input field where additional information about the configuration file can be saved. The maximum length is 32 symbols. Only ASCII characters are allowed.
Last edited	The exact time and date when the configuration was last edited.



If the configuration was loaded from the device and the **Last edited** value is *2000.01.01 00:00:00*, the device cannot get time from any source at this moment.




**FM4 Configurator 00.03.36.07 - \*Tco4 HCV.ft4c**

File    Tools

Configuration file information

Configuration source:    **Configurator**

Target device:    **Tco4 HCV**

FM device FW version:    n/a

CFG Tag:

FM4 Configurator version:    **00.03.35.03**

Last edited:    **2019-07-31 07:10:56**

If any changes were made to the currently loaded configuration, a small “\*” symbol will appear next to the name of the configuration.

## Connected Device Information

The configurator displays additional information about the connected tracking device on the left of the main configurator window. The following information will be displayed:

BL	The bootloader version.
FW	The current firmware version of the device.
IMEI	The unique IMEI code of the device.
SIM status	<p>Displays the current status of the connected SIM card and enables the <b>Lock FM device to the SIM card</b> functionality.</p> <p>The proper <b>SIM status</b> will only be shown if an external power supply is connected. Otherwise, <i>Error</i> will be displayed. Possible values:</p> <ul style="list-style-type: none"> <li><i>Ready</i> – the PIN code is acknowledged, or the PIN code check is disabled. The GSM/GPRS modem can operate normally.</li> <li><i>Error</i> – represents a wide range of possible SIM card issues. Common reason – an old FW version which does not support the SIM card.</li> <li><i>Unknown</i> – the communication between the device and the GSM/GPRS modem has failed, therefore, the SIM status is unknown.</li> <li><i>PIN Request</i> – the SIM card requests a PIN code (or the provided PIN code is incorrect).</li> <li><i>PUK Request</i> – the SIM card requests a PUK code.</li> <li><i>Locked</i> – the FM device is locked to a different SIM Card.</li> <li><i>Not inserted</i> – no SIM card is inserted.</li> </ul>
<b>Only for the 5<sup>th</sup> generation devices with BLE</b>	
BLE St	The BLE status. <i>0</i> – disabled, <i>1</i> – enabled, <i>2</i> – not connected, <i>3</i> – not supported, <i>4</i> – bad version, <i>5</i> – no power.

BLE APP	The current BLE firmware version.
BLE BL	The current BLE bootloader version.
BLE SD	The current BLE SoftDevice version.
Only for HCV5 Lite/Pro5 Lite devices	
EXT St	The CAN extender status. 0 – compatible, 1 – incompatible, 2 – not responding, 3 – no power.
EXT FW	The current CAN extender firmware version.

```

IMEI: 0000000000000000
FW: XX.XX.XX.XX
BL: XX.XX

BLE St: X
BLE APP:
BLE BL:
BLE SD:

☐ SIM status: -----

```

If the external power supply is connected to the tracking device and a SIM card with a PIN code is inserted, you will have to enter the PIN code.



If the **SIM status** checkbox is not enabled, the **Enter PIN** window will not appear when connecting to the FM device, meaning that you will not be able to access your device.

If the wrong PIN is entered three times in a row, the SIM card will be locked, requiring the PUK code, provided by the service operator. After PUK code verification, you will need to set a new PIN code.

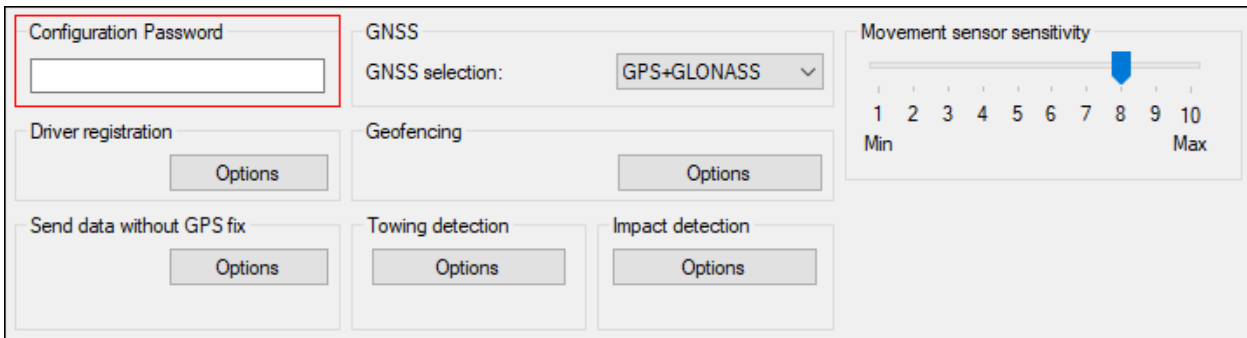


If the wrong PUK code is entered ten times in a row, the device will be permanently blocked, requiring a new SIM card.

## Configuration Password

This functionality restricts access to the configuration. If entered, you will need to enter this password each time before saving or loading the configuration.

In the main window, locate the **Configuration password** section and enter the password.




Over-the-air configuration updates ignore the configuration password.



Make sure to remember the password! If you forget the configuration password, the only way to reset it is to return the device to the manufacturer.

## Device Type and Model Selection

The functionalities that are available for configuration depend on the device type and model.

When a device is connected, the type and model are selected automatically and only the available settings for the exact type/model combination are displayed. If the model could not be detected, it is set to *Unknown* and all settings available for the device type will be displayed.

**Example:** An LCV5 device with 3G and BLE is connected. The type is set to *LCV5* and the model is set to *LCV5-3G-GL-BT*. LTE network and DMP settings are not displayed.

When no device is connected, you can manually select the device type and model in the drop-down selectors.



If you do not know the exact model of the device, select *Unknown* in the version drop-down selector. All settings available for the device type will be displayed.

COM7

Disconnect

Send CFG

Get CFG

Send FW

LCV5

LCV5-3G-GL-BT

IMEI: 869530041924230  
FW Build: 13.05  
Base FW: 00.06.00.00  
BL: 0x4e 0x4  
HW: FMP5-3-3

Global

Protocol  
☒ UDP ☐ TCP

APN settings

Name

User

Psw

☐ Lock FM device to the SIM card

☐ AutoAPN Options

Driver registration Options

Trip type detection Options

GNSS Options

Offline tracking Options

## Configuring the FM Device for the First Time

The purpose of this chapter is to help configure the FM device for the first time in order to send basic data to the server.

The **Default Configuration** is a present configuration file that makes the configuration process significantly easier and shorter. Follow these steps to load the default configuration file:

1. Select your FM device from the drop-down list. *Tco4 HCV* is selected by default.
2. Click the **File** tab, located at the top left side of the configurator, and select **Open default CFG**.

Advanced Configurator 00.06.13.13

File Tools Help

New CFG

Open default CFG

Save CFG

Open CFG

Save DIFF CFG

Open DIFF CFG

Generate SMS

Exit

Send CFG

Get CFG

Send FW

LCV5

Configurator

Target device: LCV5

CFG Tag: n/a

Last edited: 2020-08-10 13:37:15

Global

Protocol  
☐ UDP ☒ TCP

APN settings

Name

User

Psw

☐ Lock FM device to the SIM card

☐ AutoAPN Options

Connection settings

IP1

Port1 0 ☐ SSL 1

IP2

Port2 0 ☐ SSL 2

☐ Two servers

Periodical redirect

SSL settings

Identification string

Disabled

Configuration Password

Authorized numbers Options

Eco-Drive

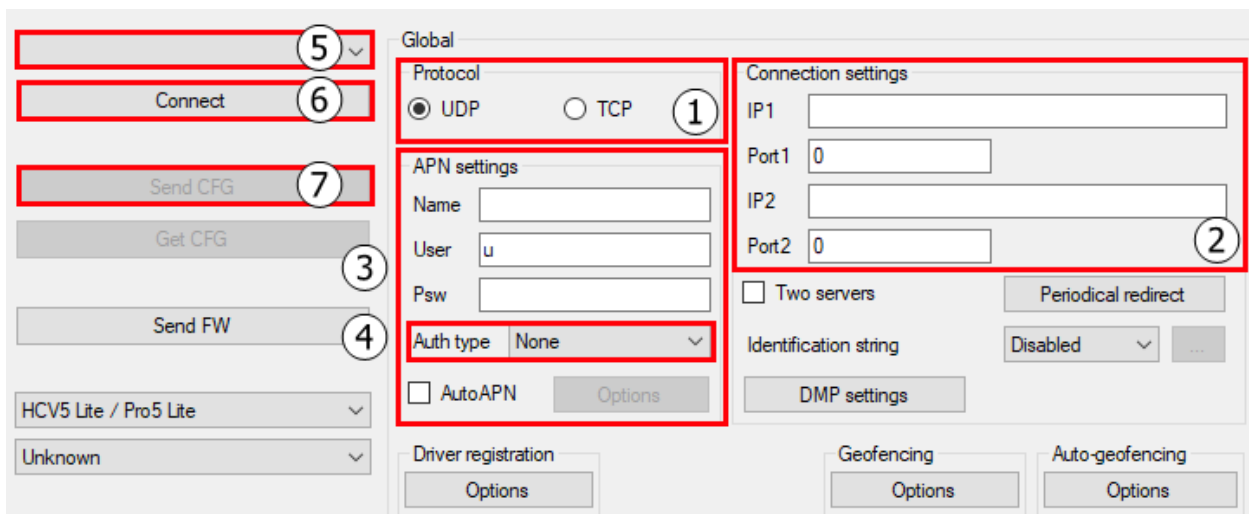
☒ Enable Options

Authorized IDs

☐ Enable Options

Default parameters will be loaded. However, you will need to enter a few other entries on your own to establish the connection and complete the configuration:

1. Select which protocol to use:
  - **UDP** – Uses less data but is less reliable. The default setting.
  - **TCP** – Uses more data but is more reliable.
2. Fill the **Connection settings**. Enter an IP address (255.255.255.255 format) or a domain name (up to 40 characters) and a **Port** where the device will send collected data. No default server is provided.
3. Fill the **APN settings**. This includes the APN name, username, and password (if they are needed). No default APN is provided.
2. HCV5 Lite/Pro5 Lite and Trace5-LTE (all versions) only: Choose the authentication type from the drop-down list: *None*, *PAP*, or *CHAP*. **AutoAPN** must be disabled.
3. Select the **COM port** through which the FM device is connected to the computer.
4. Click **Connect**.
5. Click **Send CFG** to upload the configuration to your device.



The screenshot shows the Ruptela configuration interface. On the left, there is a sidebar with buttons: 'Connect' (6), 'Send CFG' (7), 'Get CFG' (3), 'Send FW' (4), and a dropdown menu for device models (HCV5 Lite / Pro5 Lite, Unknown). The main area is titled 'Global' and contains several sections:
 

- Protocol**: Radio buttons for UDP (1) and TCP.
- APN settings**: Fields for Name, User (u), Psw, and a dropdown for Auth type (None). There is also an 'AutoAPN' checkbox and an 'Options' button.
- Connection settings**: Fields for IP1, Port1 (0), IP2, and Port2 (0) (2). It also includes checkboxes for 'Two servers' and 'Periodical redirect', and a dropdown for 'Identification string' (Disabled).
- DMP settings**: A button labeled 'DMP settings'.
- Driver registration**: An 'Options' button.
- Geofencing**: An 'Options' button.
- Auto-geofencing**: An 'Options' button.

 Numbered callouts 1 through 7 highlight specific elements: 1 points to the UDP protocol button, 2 points to the Port2 field, 3 points to the 'Get CFG' button, 4 points to the 'Send FW' button, 5 points to the top dropdown menu, 6 points to the 'Connect' button, and 7 points to the 'Send CFG' button.

Now the device is configured to send data to the specified server. Standard IO parameters are enabled (loaded with the configuration file). You can log in to your tracking platform to see whether the device is sending data.



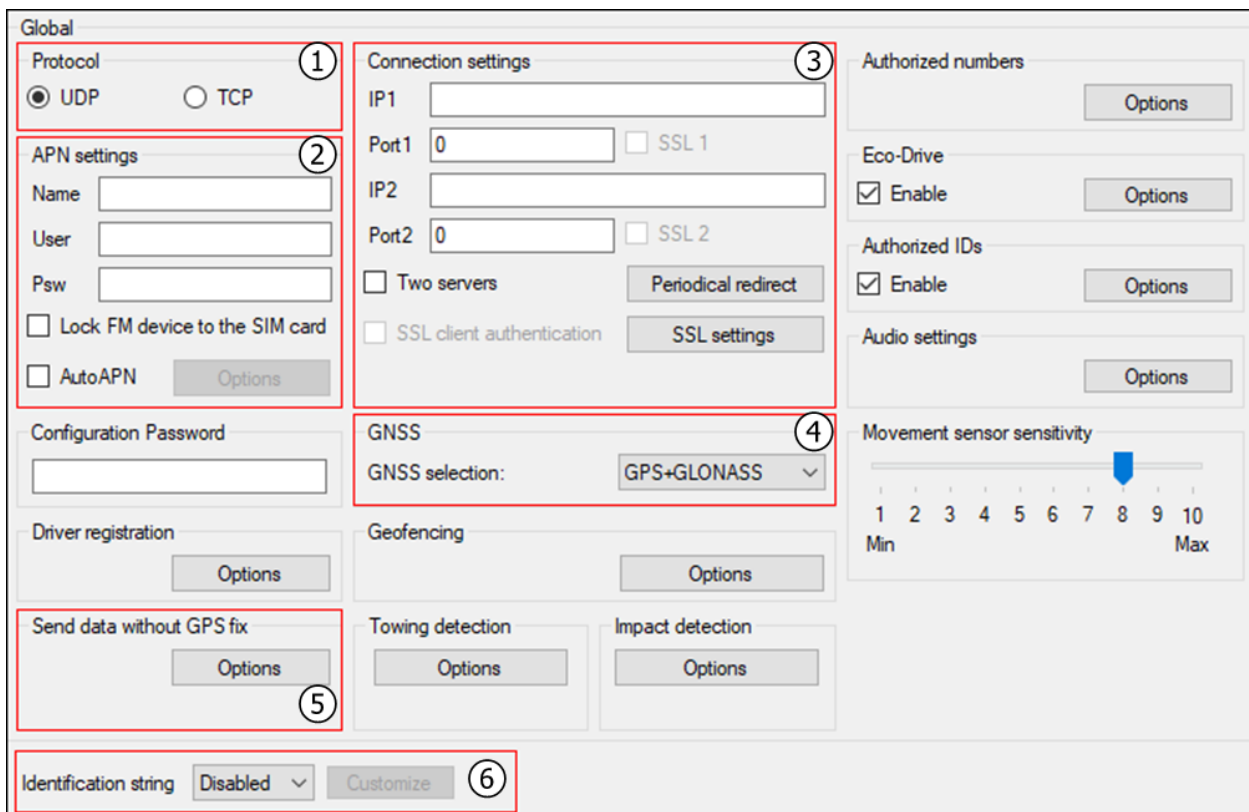
The APN settings (name, login, and password) are provided by your mobile network operator.

Proceed to the next chapters for information on how to configure the other functionalities.

## 1.3 Device Communication

This part of the configuration describes how to configure the device to establish the communication between your fleet management system platform and the tracking device. This chapter contains the following configuration settings:

1. Communication protocol
2. Access point settings
3. Connection to the server settings
4. Device positioning network settings
5. Sending data without GPS fix
6. Identification string



The screenshot displays the 'Global' configuration page with the following settings:

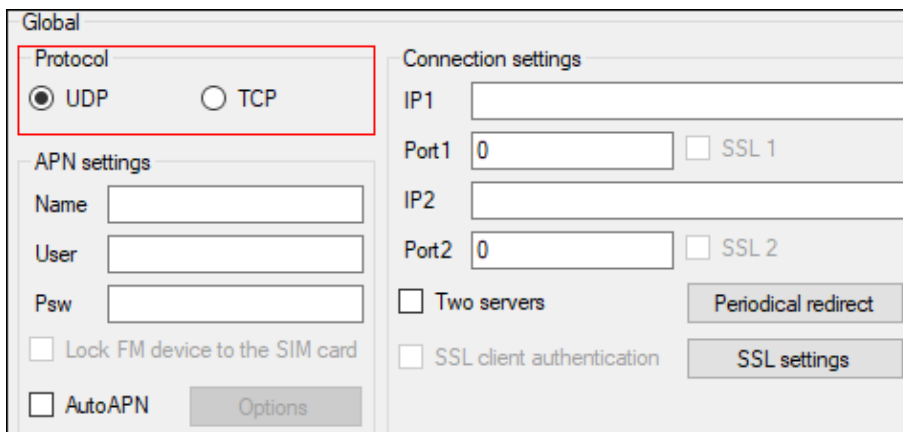
- Protocol:** UDP (selected), TCP
- APN settings:** Name, User, Psw, Lock FM device to the SIM card, AutoAPN, Options
- Connection settings:** IP1, Port1, IP2, Port2, Two servers, SSL client authentication, Periodical redirect, SSL settings
- GNSS:** GNSS selection: GPS+GLONASS
- Send data without GPS fix:** Options
- Identification string:** Disabled, Customize

## Communication Protocol

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Select which internet protocol you wish to use: **UDP** or **TCP**.

UDP	Uses less data but is less reliable. UDP does not check for lost packets or their order. The default setting.
TCP	Uses more data but is more reliable. TCP checks that all packets are received and if needed, resends the missing ones and reorders them.



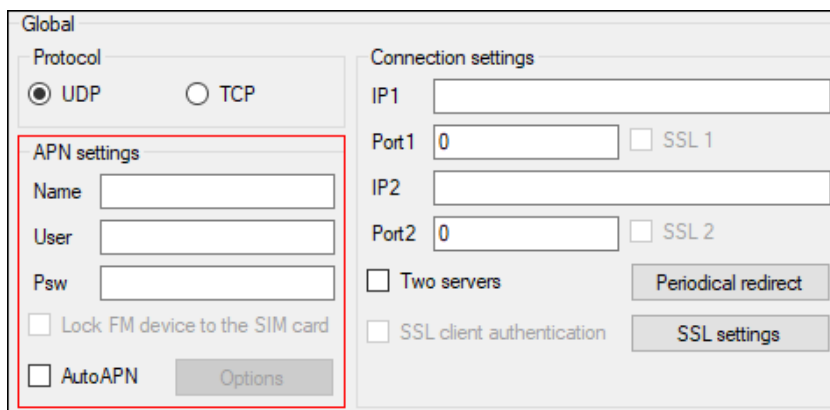
The screenshot shows the 'Global' settings window. The 'Protocol' section has two radio buttons: 'UDP' (selected) and 'TCP'. The 'APN settings' section includes fields for 'Name', 'User', and 'Psw', along with checkboxes for 'Lock FM device to the SIM card' and 'AutoAPN'. The 'Connection settings' section includes fields for 'IP1', 'Port1', 'IP2', and 'Port2', checkboxes for 'SSL 1', 'SSL 2', 'Two servers', and 'SSL client authentication', and buttons for 'Periodical redirect' and 'SSL settings'.

## APN Settings

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

APN settings are needed to connect to the internet (GPRS). They must be provided by your SIM card provider.

Name	The APN name. This parameter is mandatory and depends on the mobile network operator.
User	The APN username. This parameter is optional.
Password	The APN password. This parameter is optional.
Lock FM device to the SIM card	If enabled, the SIM card's ICCID number will be locked to the specific device. The device will not use another SIM card to connect to the network. More information: <a href="#">Lock FM device to the SIM card</a>
AutoAPN	If enabled, the APN settings will automatically be selected from a list of predefined APNs and the settings fields will be greyed out. More information: <a href="#">AutoAPN</a>



## Lock FM Device to the SIM Card

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV Tco4	LCV Pro4	Eco4	Eco S/T	Plug4	
✓*	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✗	

\* – not available for Trace5-LTE.

### Purpose

Lock the FM device to the SIM card to prevent using other SIM cards on the device. The SIM card's ICCID (a unique SIM card serial number) will be locked to the device.

### How it works



If the locked SIM card is replaced (the device detects a different ICCID), the device will not use that SIM card to connect to the mobile network.

### Activation

1. Tick the **SIM status** checkbox in the connected device information bar located at the bottom of the configurator window.
2. Enable the **Lock FM device to the SIM card** functionality in the **APN settings** section.
3. Click the **Send CFG** to send the configuration to the device and activate the functionality.

### AutoAPN

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✗

### Purpose

APN settings are needed to establish an internet connection. Without the APN settings, the device will not send any data. These settings are provided by your mobile network provider.

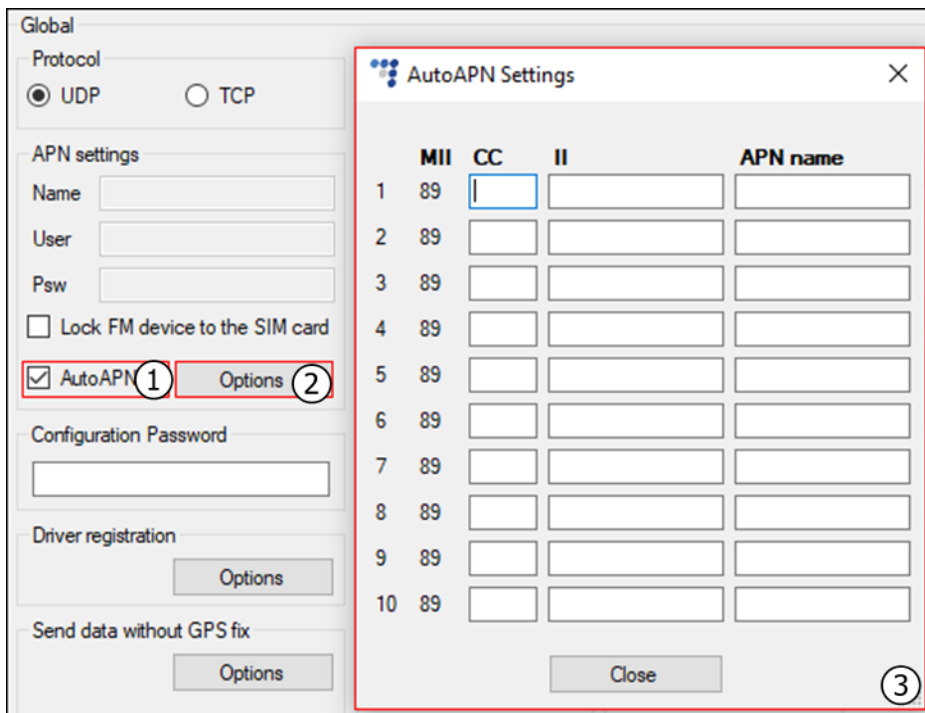
### How it works

When activated, the APN will be automatically selected from a list of predefined APNs and the setting fields will be greyed out. The selection is made according to the SIM card's ICCID. If there is no suitable APN detected, the first APN in the list will be used. If there is no GPRS connectivity, the device will attempt to connect to the next APN in the list.

### Activation

1. Tick the **AutoAPN** checkbox in the **APN settings** section.
2. Click the **Options** button to open the **AutoAPN Settings** window.
3. Enter at least one entry of APN settings. Each entry contains the following input fields:

MII	Major Industry Identifier, the value is pre-set and is always 89.
CC	Country Code (for example, "370")
II	Issuer Identifier
APN name	The name of the APN



## Connection settings

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

Configure connection settings to connect to the fleet management platform tracking server.



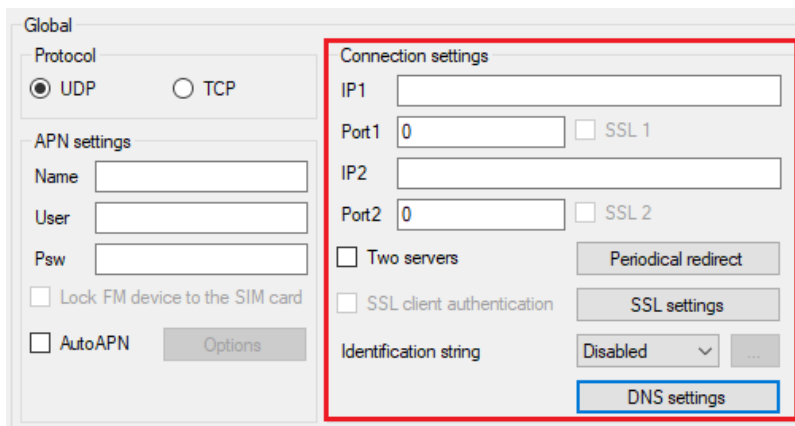
The device will not send any data without IP and port settings.

IP	<p>The IP address of the server. You may enter a numerical address or domain name (up to 40 characters).</p> <p><b>IP2</b> is optional is and used for a backup server, which is used when the device is unable to connect to the first server.</p> <p>Default value: <i>None</i></p>
----	---

Port	<p>The port of the server.</p> <p><b>Port2</b> is optional and is used for a backup server, which is used when the device is unable to connect to the first server.</p> <p>Default value: 0</p>
SSL1/2	<p>Used to establish an encrypted connection between the server and the client.</p> <p>More information: <a href="#">SSL Authentication</a> chapter.</p> <p>Default value: <i>Disabled</i></p>
Two servers	<p>Used to repeatedly transmit the same data to two servers.</p> <p>More information: <a href="#">Two servers</a> chapter.</p> <p>Default value: <i>Disabled</i></p>
Periodical redirect	<p>Used to periodically redirect the FM device to a specified server to initiate automatic updates when 3<sup>rd</sup> party tracking software is used.</p> <p>More information: <a href="#">Periodical Redirect</a> chapter.</p>
SSL client authentication	<p>Used to enable SSL authentication on the client-side.</p> <p>Default value: <i>Disabled, Inactive</i></p>
SSL settings	Used to configure SSL authentication settings for the server and the client.
Identification string	<p>Allows defining the identification packet which is transferred to the server.</p> <p>More information: <a href="#">Identification String</a> chapter.</p>
DNS Settings	<p>The DNS address of the server. You can change the server's default DNS address, given by your network provider.</p> <p>More information: <a href="#">DNS Settings</a> chapter.</p>



UDP and TCP protocols may have different ports. Make sure you select the correct protocol and enter the correct ports.



## Two Servers

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

### Purpose

Used to repeatedly transmit the same data to two servers.

### How it works

When activated, the same data is repeatedly transmitted to another server with **IP2** and **Port2**, unless a timeout occurs. **IP1** is the primary server, it sends acknowledgment (ACK) packets when it receives records. After the ACK packet is received, the record is considered as successfully transmitted to the server and it is deleted from the device memory.

Only records are sent to the server with **IP2**. Other data packets, such as Transparent Channel, Tachograph, SD card, Garmin will not be sent to the second server.

Scenarios when data cannot be sent to the **IP2** server:

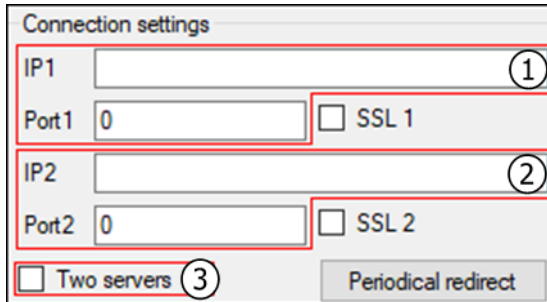
- If the connection to the **IP1** server is not established, the device does not connect to the **IP2** server as well.
- If the connection to the **IP1** server is established, but the **IP2** server is unavailable after an ACK packet from **IP1** is received, the data will be deleted from the device memory. This may result in data loss in the **IP2** server.



The **Two servers** mode doubles the amount of data that is being sent and may incur additional costs.

## Activation

1. Enter **IP1** and **Port1** of the first server.
2. Enter **IP2** and **Port2** of the second server.
3. Tick the **Two servers** checkbox to enable the functionality.



## Periodical Redirect

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

## Purpose

Used to periodically redirect the FM device's sent data to a specified server to initiate automatic configuration/firmware updates when using 3<sup>rd</sup> party tracking software.

## How it works

Once the **Period** timer passes, the device checks the following conditions:

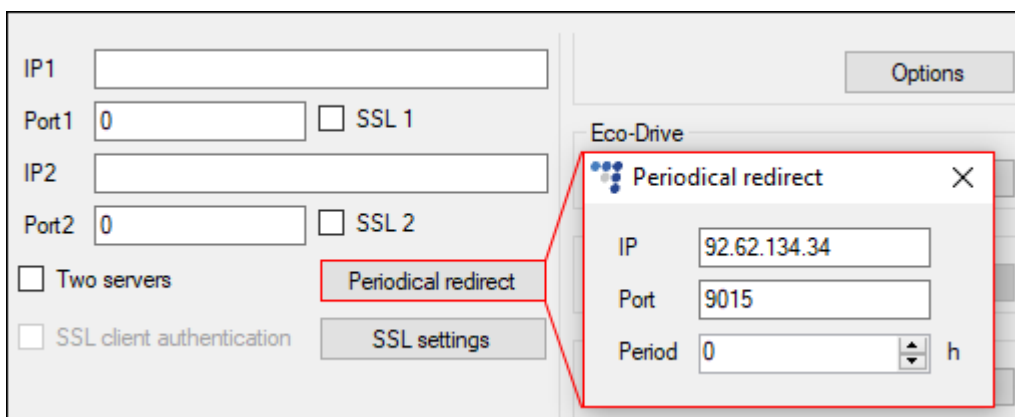
- If there are any unsent records in device memory
- If the GSM signal is weak (the GSM level is lower than 9 out of 32)
- If the power supply voltage is lower than 8 volts (power supply voltage status is 0)
- If the device is in a critical process (for example, firmware update)

If at least one condition is true, the device waits until all conditions are false. After that, the device connects to the configured server. Then the device initiates updates and closes the connection. The **Period** timer is then reset.

## Activation

Click the **Periodical redirect** button in the **Connection settings** section. The **Periodical redirect** window will open. Configure the following settings:

IP	Enter an IP of the server. Default value: 92.62.134.34 (TrustTrack server)
Port	Enter a port of the server. Default value: 9015 (TrustTrack server)
Period	Set timer in hours. Default value: 0 (disabled) Maximum value: 168 h (7 days)



## SSL Authentication



Detailed functionality description: [SSL Authentication](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✓	⊘	✓		✓		✓	⊘	✓	⊘

\* – not available with the initial release for Trace5-2G, Trace5-LTE and Trace5-LTM (Rev.A).

### Purpose

SSL (Secure Sockets Layer) is a security technology used to establish encrypted connections between server and client, as well as authenticating the identity of the server/client. All transmitted data is encrypted.



The SSL authentication functionality increases data consumption and may incur additional costs.

## How it works

An **SSL certificate** is required to create an SSL connection. The **SSL certificate** is a file installed on the server-side. An additional certificate can be installed on the client-side for extra security.



If *ereconnect* or *connect* SMS commands are used along with SSL, the device will **disable** SSL for that connection. To ensure that no unauthorized device sends SMS commands, it is highly recommended to use the authorized numbers functionality, described in the [Authorized Numbers](#) chapter.



If the functionality is configured incorrectly (e.g., wrong certificates were uploaded), the device will not send any data to the server. The only way to restore data transmission is to reconfigure the device.

## Activation



To activate the functionality, an external power supply must be connected to the device. It is needed to start up the GSM module, where the SSL certificate is stored.

1. Enable the **TCP** protocol in the **Protocol** section.
2. Tick the **SSL [1/2]** checkbox to enable the SSL functionality for the specific server.

A pop-up warning window will always appear, informing that if SSL is enabled without uploading the certificates, the device will remain unprotected.

3. *Optional.* Tick the **SSL client authentication** checkbox to enable SSL authentication on the client side. To activate, upload a client certificate and private key in **SSL settings**.
4. Click the **SSL settings** button. The **SSL Settings** window will open.
5. Configure **SSL settings** according to your needs. The following actions can be taken:

Load	<p>Used to upload an appropriate certificate for the following certificate types:</p> <ul style="list-style-type: none"> <li>• Server 1/Server2 CA</li> <li>• Client certificate</li> <li>• Private key</li> </ul> <p>The files cannot be larger than 2025 bytes. <b>Status</b> and <b>CRC</b> columns are displayed for each certificate for additional information.</p>
------	---

OCSP	Used to enable the <b>OCSP</b> validation for that server. OCSP validation is performed after device boot and periodically every 4 hours. Currently unavailable for Trace5 devices.
Refresh status	Click the button to update the status of all files. Possible values: <ul style="list-style-type: none"> <li>• Uploaded</li> <li>• Empty</li> <li>• Unknown</li> </ul>
Remove all certificates	Deletes all certificates and key files stored in the FM device. The statuses will be updated automatically.

The screenshot displays the 'Global' configuration window with the 'TCP' protocol selected (1). Under 'Connection settings', 'SSL 1' and 'SSL 2' are checked (2). The 'SSL client authentication' checkbox is unchecked (3). The 'SSL settings' button is highlighted (4). An 'SSL Settings' dialog is open in the foreground (5), showing a table of certificates and their OCSF status.

	Status	CRC	OCSP
Server 1 CA	Unknown	Load	<input checked="" type="checkbox"/>
Server 2 CA	Unknown	Load	<input type="checkbox"/>
Client certificate	Unknown	Load	
Private key	Unknown	Load	

Buttons in the dialog: Refresh status, Remove all certificates, Close.



OCSP validation will not be performed if **Two servers** mode is enabled.



## Identification String



A full functionality description: [Identification String](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

### Purpose:

The identification string functionality allows defining the identification packet which is transferred to the server. After the tracking device sends the identification packet, it begins data transfer.



If the identification string feature is enabled, the transparent channel functionality cannot be used and vice versa.

This functionality has three modes:

Identification string	<p><i>1. Disabled</i></p> <p>The functionality is disabled.</p> <p><i>2. Static</i></p> <p>If enabled, the following parameters will be included in the identification packet (unavailable for 5th generation devices):</p> <ul style="list-style-type: none"> <li>• Device type</li> <li>• Firmware version</li> <li>• IMSI code</li> <li>• GSM operator code</li> </ul> <p>Coefficients:</p> <ul style="list-style-type: none"> <li>• Distance</li> <li>• Time</li> <li>• Angle</li> </ul> <p><i>3. Dynamic</i></p> <p>If enabled, click the <b>Customize</b> button to select what parameters to include into the identification string (unavailable for Eco4 and Plug4 devices):</p>
-----------------------	--

	Default value: <i>Disabled</i>
--	--------------------------------

☐ Two servers  
☐ SSL client authentication

Periodical redirect

SSL settings

Identification string

Disabled

...

## DNS Settings

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✗	✗	✗		✗	✗	✗	✗	✗	✗

\* – not available with the initial release for Trace5-2G, Trace5-LTE and Trace5-LTM (Rev.A).

### Purpose:

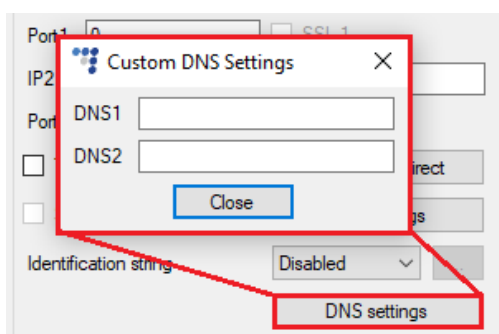
This functionality allows you to set the custom DNS server address. By default, the DNS address, provided by the network provider is used.



The address should be string type and have a maximum length of 32 symbols.

### Activation:

1. Click the **DNS Settings** button.
2. Enter the required DNS server address to the **DNS1** field.
3. Enter the required DNS server address to the **DNS2** field.



## DMP Settings

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✓	✗	✗		✗	✗	✗	✗	✗	✗

\* – not available for pre-revision Trace5 devices.

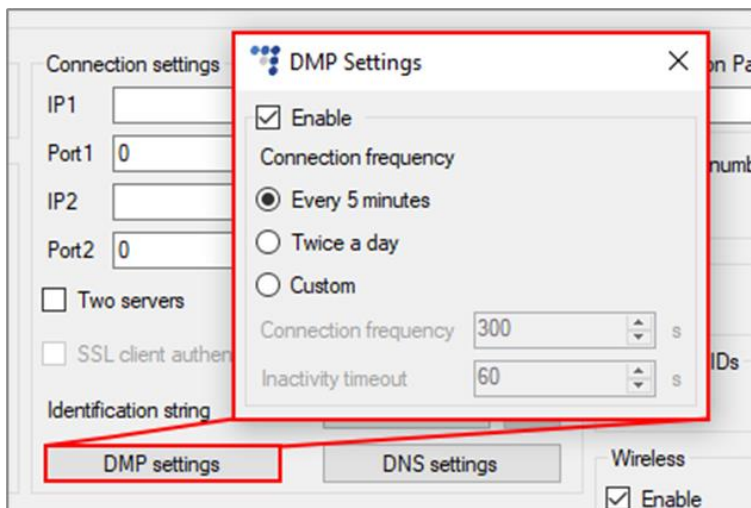
### Purpose:

This functionality allows you to set how the device will connect to the device management platform (DMP) to receive remote firmware and/or configuration updates. The connection to the device management platform is enabled by default. Contact technical support to disable it.

### Activation:

1. Click the **DMP Settings** button.
2. Set the **Connection frequency**.

Connection frequency	<p>Set how often the device will connect to the device management platform.</p> <p>Possible values:</p> <ul style="list-style-type: none"> <li>• Every 5 minutes</li> <li>• Twice a day</li> <li>• <i>Custom</i> – allows setting the following: <ul style="list-style-type: none"> <li>○ <b>Connection frequency</b> – set a custom connection frequency</li> <li>○ <b>Inactivity timeout</b> – set how long the device will wait for updates after connecting before closing the connection</li> </ul> </li> </ul> <p>Default value: <i>Every 5 minutes</i></p>
----------------------	---



## GNSS

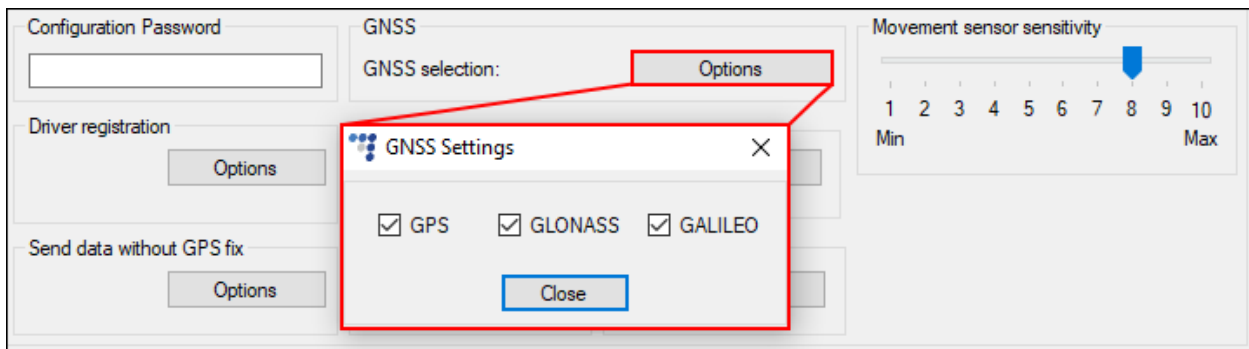
5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✗

Select which positioning systems you wish to use. Typically, the more systems are used, the more satellites are visible and the more accurate the position is. We recommend using all three positioning systems.



If the vehicle is often near airports, governmental institutions or other places where signal spoofing might be used, you can disable the spoofed system to receive more accurate position data.

<b>GNSS selection</b>	<p>Which positioning systems will be used. Available systems:</p> <ul style="list-style-type: none"> <li>• <i>GPS</i></li> <li>• <i>GLONASS</i></li> <li>• <i>GALILEO</i></li> </ul> <p>Default value: All systems</p>
-----------------------	--



Only devices manufactured since late 2017 support the Galileo positioning system.



The Galileo positioning system cannot be used on its own as it is still in development and has not yet reached its full operational capacity.



For FM-Plug4 devices, all 3 positioning systems are enabled in the background and this setting cannot be changed.

## GNSS Antenna Selection

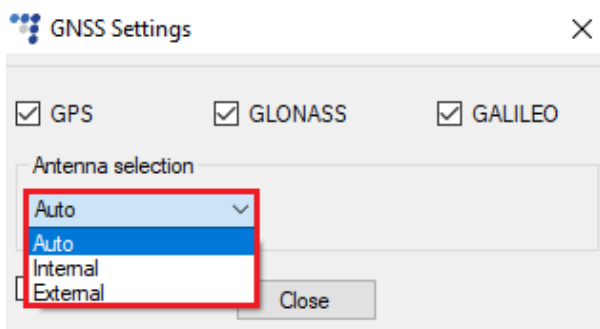
5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
⊘	✓	✓	✓	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘	⊘

In some devices with external and internal GNSS antennas, there is a possibility to automatically switch to the internal antenna if the external antenna is disconnected or damaged.

The functionality has three modes:

Antenna selection	<p><i>1. Auto</i></p> <p>Checks the external antenna status, and if the status is not OK, the tracking device instantly switches to the internal antenna and does not switch back to the external antenna until the next start-up of the GNSS module.</p> <p>This mode is selected by default.</p>
-------------------	--

	<p><i>2. Internal</i></p> <p>If selected, the tracking device will always use the internal antenna.</p> <p><i>3. External</i></p> <p>If selected, the tracking device will use the external antenna and will not switch to the internal antenna despite the external antenna status.</p>
--	--



✓ You can check which antenna is used by enabling the *GNSS antenna used* parameter in the IO events.

## Assisted GNSS

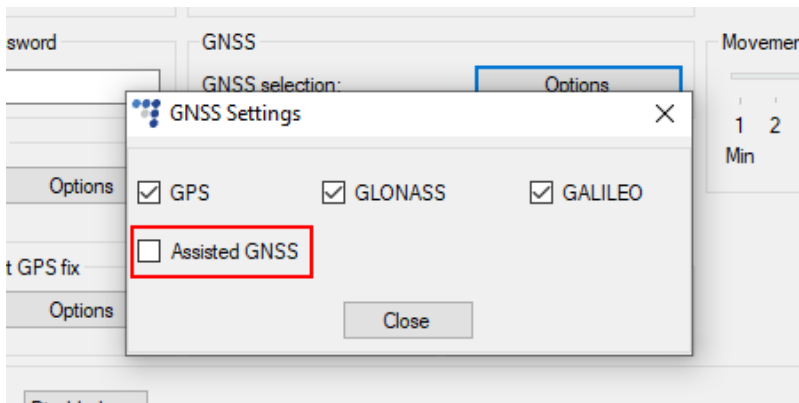
5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4 HCV	Tco4 LCV	Pro4	Eco4	Eco S/T		Plug4
✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	Eco4 T and RS T only		✗

\* – not available with the initial release for Trace5-2G, Trace5-LTE and Trace5-LTM (Rev.A).

Enable the Assisted GNSS functionality to speed up the GNSS fix acquisition process. It can decrease GNSS fix acquisition down to 25 seconds in normal conditions, and down to 4-6 seconds if the device was previously in sleep mode with an active modem.

Assisted GNSS works by downloading additional data from U-blox servers. The data is downloaded after the device boots up or wakes up from sleep mode if there was no previous GNSS fix.

To enable the Assisted GNSS functionality, tick the **Assisted GNSS** checkbox.



 Assisted GNSS increases data consumption by about 5 kB for every assisted GNSS fix.

## Send Data Without GPS Fix

 A full functionality description: [Offline Tracking](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

This functionality covers two methods on how to send data without a GPS fix.

1. **Send data without GPS fix** – device cold-start often causes problems because it is not sending data, therefore the user is unable to see parameter values until a GPS fix is obtained. This functionality allows data sending even when there is no GPS fix.
2. **GSM tracking** – when the device loses GPS fix, there is no way to determine its location. The GSM tracking feature can be used to obtain an approximate location in densely urbanized areas, where the GNSS signal is not available. Unavailable for Trace5 devices.

Tick the checkbox to enable the functionality and configure its settings according to the full functionality description.

The screenshot displays the Ruptela configuration interface. On the left, a sidebar contains several sections: 'AutoAPN' with an 'Options' button, 'Configuration Password' with a text input field, 'Driver registration' with an 'Options' button, 'Send data without GPS fix' with an 'Options' button (highlighted by a red box), 'Identification string' with a 'Disabled' dropdown, and 'Profile 1' through 'Profile 4' tabs. Below these is a 'Sleep' section with a 'Disabled' dropdown and a time input of '600' seconds. The main area on the right shows the 'Send data without GPS fix' dialog box, which is also highlighted by a red box. This dialog has a title bar with a close button and contains the following settings:

- ☐ Send data without GPS fix **Do not use with TrustTrack server!**
- Collect data without time ☐
- Use time synchronization: **None** (dropdown)
- NTP server: (text input)
- Refresh interval: **0** (spinner) h
- ☐ Enable GSM tracking
- Track when engine is ON ☒
- Request position after, s: **300** (spinner)
- Request interval, s: **300** (spinner)
- Close** button



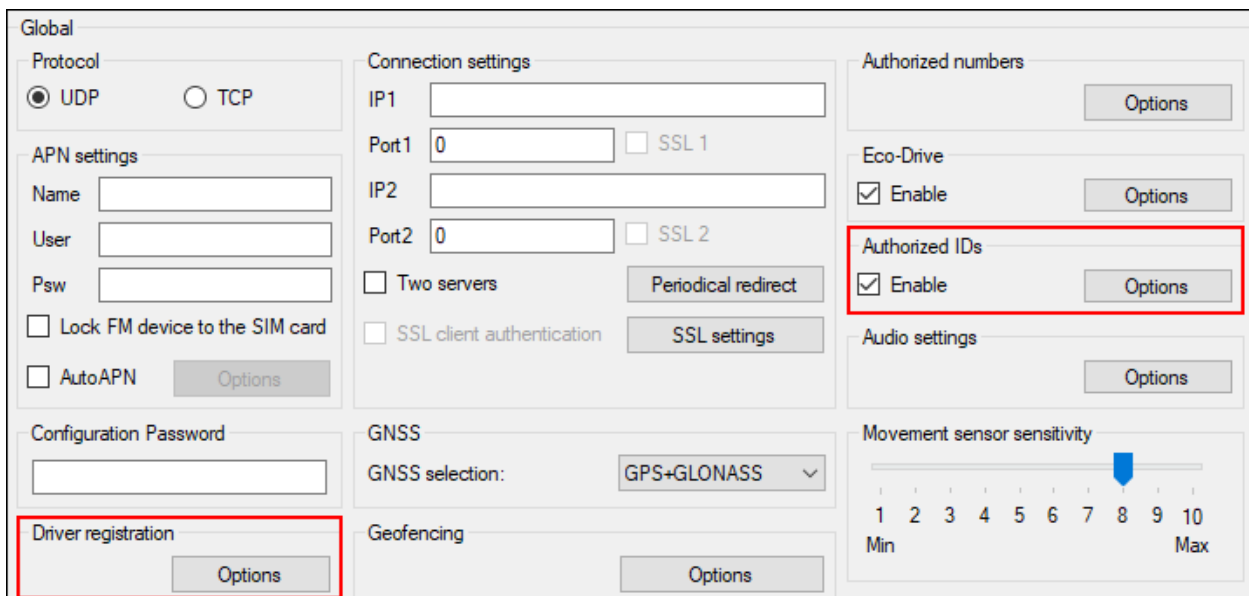
## 1.4 Driver Registration and Authorization

✓ A full functionality description: [Driver Registration](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✗	✓	✓		✓	✓	✓	✓	✓	✗

\* – not available for pre-revision Trace5 devices.

The driver registration functionality is used to authorize vehicle start, identify the driver, and account working hours. In the **Driver registration** options, you can set one of our prepared driver registration types. RFID card reader and iButton registration sources are supported. It is possible to set FM device outputs to indicate registration information via a LED, a buzzer, or even use it to block the vehicle ignition. This part of the configuration summarizes how to configure driver registration and authorization settings. Refer to the driver registration manual for an in-depth description.



The screenshot shows the configuration interface with the following sections:

- Global:** Protocol (UDP selected), APN settings (Name, User, Psw, Lock FM device to the SIM card, AutoAPN), Configuration Password, and **Driver registration** (highlighted with a red box).
- Connection settings:** IP1, Port1, IP2, Port2, SSL 1, SSL 2, Two servers, Periodical redirect, SSL client authentication, and SSL settings.
- Authorized numbers:** Options button.
- Eco-Drive:** Enable checkbox, Options button.
- Authorized IDs:** Enable checkbox, Options button (highlighted with a red box).
- Audio settings:** Options button.
- GNSS:** GNSS selection (GPS+GLONASS selected).
- Geofencing:** Options button.
- Movement sensor sensitivity:** Slider from 1 (Min) to 10 (Max), currently set at 8.

In short, the driver registration and authorization settings are configured as follows:

1. Configure peripheral devices connected to the FM device's DOUTs.
  - o Locate the **IO events** section in the main window. Click the **Options** button. A new **IO settings** window will open.

- Configure the peripherals in the **Digital outputs** section.
- 2. Configure the **Driver registration** settings.
  - Locate the **Driver registration** section in the main window. Click the **Options** button. A new **Registration settings** window will open.
  - Configure the **Driver registration** settings.
- 3. *Optional.* Configure the **Authorized IDs** functionality if you want to accept only authorized IDs.
  - Tick the **Enable** checkbox to enable the functionality in the **Authorized IDs** section.
  - Click the **Options** button. A new **Authorized IDs** window will open.
  - Enter peripheral (iButton, RFID, or magnetic card) IDs, which are allowed to unblock or register.

The screenshot displays the Ruptela configuration interface. The main window has several sections: User, Port2, SSL 2, Two servers, Periodical redirect, Authorized IDs, Audio settings, Configuration Password, Driver registration, Send data without GPS fix, Identification string, Profile 1, Profile 2, Profile 3, Profile 4, Sleep, Data sending, Engine, and IO events.

The **Driver registration** section is highlighted with a red box and a circled '2' next to its **Options** button. This button opens the **Registration settings** window, which is also highlighted with a red box. The **Registration settings** window contains the following fields:

- Registration function:** Disabled (dropdown)
- Output:** (empty text box)
- Registration source:** iButton (dropdown)
- Input:** DIN3 (dropdown)
- Passenger registration:** (checkbox, unchecked)
- Passenger should stop buzzer:** (checkbox, unchecked)
- Buzzer/LED alarm when the engine is blocked:** (checkbox, unchecked)
- Deregistration timeout, s:** 300 (spinner)
- Buzzer/LED duration, s:** 2.0 (spinner)
- Alert duration, s:** 0 (spinner)
- Only Authorized IDs:** (checkbox, unchecked)
- Reset all IDs:** (checkbox, unchecked)
- Reset Passenger ID:** (checkbox, unchecked)















The **Authorized IDs** section in the main window is also highlighted with a red box and a circled '3' next to its **Options** button. This section contains the **Enable** checkbox, which is checked, and the **Options** button.

The **IO events** section at the bottom right is highlighted with a red box and a circled '1' next to its **Options** button.

## 1.5 Trip Type Detection



A full functionality description: [Trip Type Detection](#).


5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
														

The trip type detection functionality allows you to register a particular trip as private or business.

The following parameters can be configured:

Trip type source	<p>Select to which digital input a button/switch is connected.</p> <p>Default value: <i>DIN1</i>.</p>
Trip type logic	<p>Select, which logic will be used to define the trip type:</p> <ul style="list-style-type: none"> <li><i>Low: Private, High: Business</i> – if the switch is OFF, the trip is considered to be private. If the switch is ON, the trip is considered to be business.</li> <li><i>Low: Business: High: Private</i> – if the switch is OFF, the trip is considered to be business. If the switch is ON, the trip is considered to be private.</li> <li><i>Switch on pulse</i> – is used only with a push button. When a button is pressed, the trip type changes. <b>Default value</b> can be set to <i>Private</i> or <i>Business</i>. Additionally, set how the trip type changes when turning the ignition on: <ul style="list-style-type: none"> <li><i>Keep current type</i> – the trip type does not change.</li> <li><i>Switch to 'Business'</i> – the trip type changes to business.</li> <li><i>Switch to 'Private'</i> – the trip type changes to private.</li> </ul> </li> </ul> <p>In this mode, you can also enable the <b>Preserve trip type when the ignition is switched off</b> checkbox, which allows you to save the last set trip type after switching off the ignition. When the ignition is turned on, the saved trip type is set again.</p> <p>Default value: <i>Private, Keep current type</i>.</p>

Default value: *Low: Private, High: Business*

 Trip type detection ×

☒ Enable

Trip type source:

DIN1

Trip type logic:

☐ Low: Private, High: Business

☐ Low: Business, High: Private

☒ Switch on pulse

Default value ☒ Private ☐ Business

On ignition on:

☒ Keep current type

☐ Switch to 'Business'

☐ Switch to 'Private'

☐ Preserve trip type when ignition is switched off

Enable IO

## 1.6 Eco-Drive



A full Eco-Drive configuration description: [Eco-Drive configuration](#).



A full Eco-Drive parameter description: [Eco-Drive parameters description](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV Tco4	LCV Pro4	Eco4	Eco S/T	Plug4	
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

The purpose of this functionality is to cut transport operation costs by teaching drivers fuel-efficient and safe driving, thus, reducing damage to the vehicle and environment. This functionality is enabled by default.

**Connection settings**

IP1

Port1  ☐ SSL 1

IP2

Port2  ☐ SSL 2

☐ Two servers

☐ SSL client authentication

**Authorized numbers**

**Eco-Drive**

☒ Enable

**Authorized IDs**

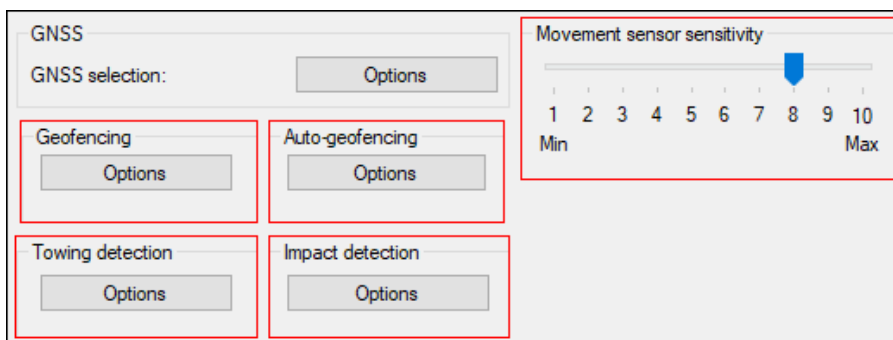
☒ Enable

**Audio settings**

## 1.7 Vehicle Movement

This part of the configuration describes how to configure various functionalities related to vehicle movement. This chapter contains the following configuration settings:

1. Geofencing
2. Auto-geofencing
3. Towing detection
4. Impact detection
5. Movement sensor sensitivity



## Geofencing

✓ A full functionality description: [Geofencing](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓*	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✗

\* – partially available with the initial release for Trace5-2G, Trace5-LTE and Trace5-LTM (Rev.A).

The geofencing functionality allows getting information and alerts about the vehicle in/out of geofences (specified areas). Two types of geofences are available:

- Circular
- Multipoint

Configuration Password <input type="text"/>	GNSS GNSS selection: <input type="button" value="Options"/>
Driver registration <input type="button" value="Options"/>	<div>Geofencing <input type="button" value="Options"/></div> <div>Auto-geofencing <input type="button" value="Options"/></div>
Send data without GPS fix <input type="button" value="Options"/>	<div>Towing detection <input type="button" value="Options"/></div> <div>Impact detection <input type="button" value="Options"/></div>

## Auto-Geofencing



A full functionality description: [Geofencing](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✗	✓	✗

\* – not available with the initial release for Trace5-2G, Trace5-LTE, and Trace5-LTM (Rev.A).

Auto-geofencing creates a circular geofence of a defined radius around the vehicle after the engine is off for a defined time. This can be used to receive alerts when the vehicle leaves the geofence while the ignition is off and can be used for theft prevention.

Configuration Password <input type="text"/>	GNSS GNSS selection: <input type="button" value="Options"/>
Driver registration <input type="button" value="Options"/>	<div>Geofencing <input type="button" value="Options"/></div> <div>Auto-geofencing <input type="button" value="Options"/></div>
Send data without GPS fix <input type="button" value="Options"/>	<div>Towing detection <input type="button" value="Options"/></div> <div>Impact detection <input type="button" value="Options"/></div>

## Towing Detection


✓ A full functionality description: [Towing Detection](#).


5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✗	✗	✓		✓	✓	✓	✓	✓	✓

\* – not available with the initial release for Trace5-2G, Trace5-LTE and Trace5-LTM (Rev.A).

Configure towing detection to know if your vehicle is being towed. Towing is detected when the vehicle tilt changes by a configured angle. This may help to save the driver's time and money.

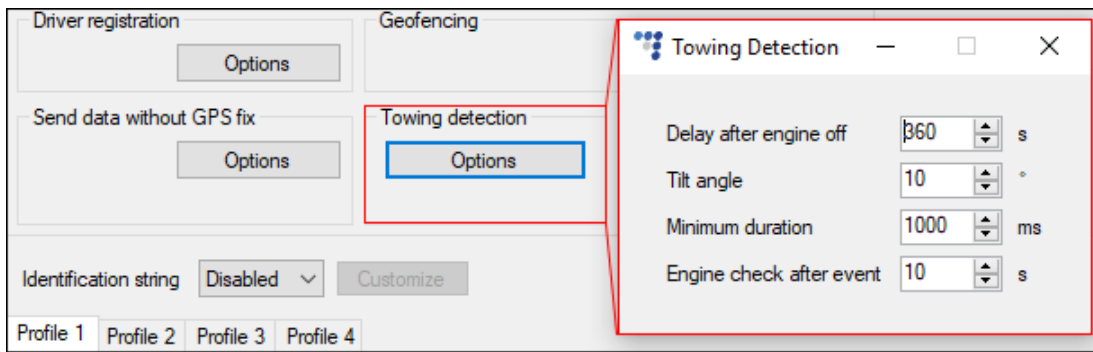
The towing detection mechanism works only when the engine is turned off. If the device detects a change in acceleration (defined in the configuration) and if it lasts for a defined period, then towing is detected.

 The *Towing alarm* IO parameter must be enabled to register towing detection events.

 Setting *Movement sensor* as the engine source will disable towing detection.

Delay after engine is off	Towing detection becomes active after this period. Default value: 360 s
Tilt angle	The minimum tilt angle change required for towing to be detected. Default value: 10°
Minimum duration	For how long the tilt must be detected for towing to be detected. Default value: 1000 ms
Engine check after event	For how long after a detected towing event the device will monitor the engine state. Default value: 10 s





## Impact and Rollover Detection



A full functionality description: [Impact and Rollover Detection](#).

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓

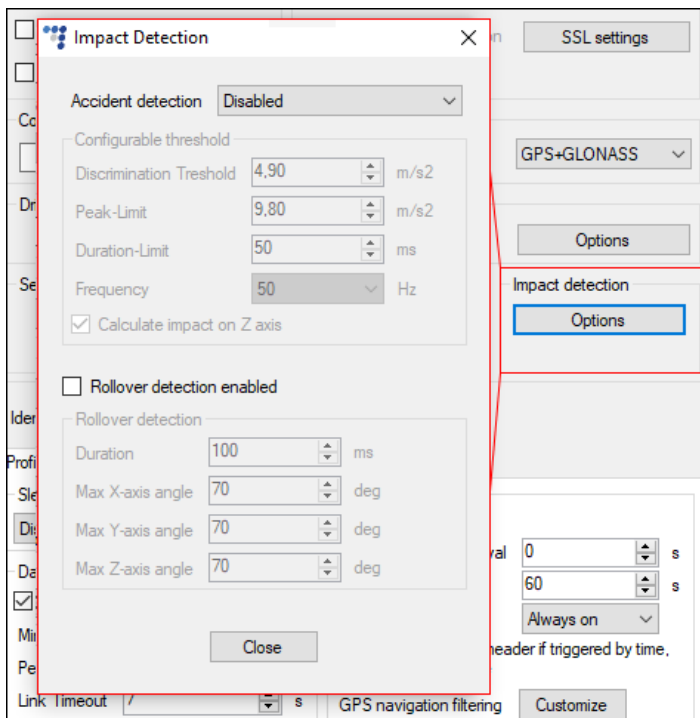
The tracking device monitors its acceleration in all directions and generates records whenever the acceleration exceeds the configured limits. You can use impact detection to receive notifications to the server about irresponsible drivers, who hit sidewalks or other obstacles, or when the driver gets into an accident. This feature can also be used for rollover detection in environments, where vehicle rollover is possible.



To ensure proper operation of impact and rollover detection, the accelerometer must be calibrated. The accelerometer is calibrated automatically when driving, taking up to an hour of driving in an urban location. The existing calibration can be reset using the *accreset* SMS command. Use the *accreset r* SMS command to receive calibration process status.

This chapter covers two different vehicle impact type configurations:

1. Accident detection
2. Rollover detection



## Accident Detection

### Purpose

The functionality is used to detect accidents and notify when the vehicle hits an object.

### How it works

The functionality monitors the acceleration in all directions and generates records when the acceleration exceeds configured parameters limits.



If accident detection is enabled, the device cannot enter sleep or deep sleep mode.

### Activation

1. Click **Options** in the **Impact detection** section.
2. From the **Accident detection** drop-down list, select *Dynamic Threshold*.

*Dynamic threshold* is not available for FM-Eco4 and FM-Plug4 devices.



For better performance, we highly recommend using *Dynamic Threshold* over *Configurable threshold* option in most.

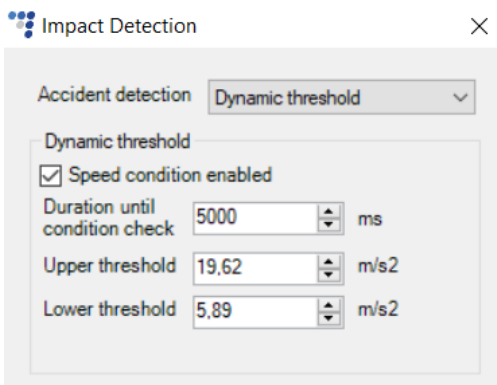
3. Configure the parameters required for the dynamic threshold:

Speed condition enabled	If ticked, an additional speed condition will be used that checks if the vehicle has stopped.
-------------------------	---

	Default value: Disabled
Duration until condition check	If the vehicle stops during this time period after an impact, a record is generated. Default value: 5000 ms
Upper threshold	The highest value the peak limit can obtain. Default value: 19.62 m/s <sup>2</sup>
Lower threshold	The lowest value the peak limit can obtain. Default value: 5.89 m/s <sup>2</sup>



If the speed condition is enabled, a record will be generated even if the vehicle stops normally during the configured time period.



We advise you to increase the thresholds under bad road conditions:

**Upper threshold** → 27.5 m/s<sup>2</sup>

**Lower threshold** → 7.8 m/s<sup>2</sup>.

We do not recommend exceeding these values, as it may filter out real impact notifications.



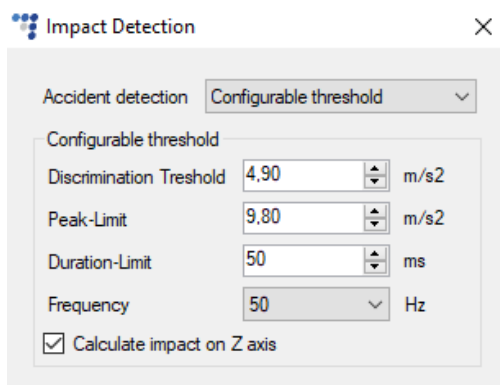
It is not recommended to use the speed condition with heavy vehicles, as it might take a long time for a heavy vehicle to stop even after a real impact due to its high inertia (mass).

4. Enable **Accident detection** IO parameters in **IO settings** to register accident events.

In exceptional cases or if the device does not have the *Dynamic threshold* option, select *Configurable threshold* during the second step. Configure the parameters according to your needs:

Discrimination Threshold	At what amplitude shock measurements start. Default value: 4.9 m/s <sup>2</sup> (0.5 g)
--------------------------	--

Peak-Limit	The minimum amplitude needed for a shock event to be registered. Default value: 9.8 m/s <sup>2</sup> (1 g)
Duration-Limit	For how long the amplitude must be above the discrimination threshold for a shock event to be registered. Default value: 50 ms
Frequency	How often the device checks whether a shock event has occurred. Default value: 50 Hz
Calculate impact on Z axis	If ticked, the Z-axis will be included in impact detection measurements. Default value: Enabled



## Rollover Detection

### Purpose

The rollover detection functionality is used to inform if the vehicle has rolled over.

### How it works

Rollover is detected when the vehicle tilt changes by a configured angle in any direction.

### Activation

Click **Options** in the **Impact detection** section.

1. Tick the **Rollover detection enabled** checkbox to enable the functionality.
2. Configure **Rollover detection** parameters according to your needs:

Rollover detection enabled	If ticked, rollover detection will be enabled. Default value: Disabled.
----------------------------	--

Duration	For how long the tilt must be detected for rollover to be detected. Default value: 100 ms
Max X-axis angle	The maximum allowed X-axis tilt. If the tilt angle is greater than the entered value, a rollover event is detected. Default value: 70°
Max Y-axis angle	The maximum allowed Y-axis tilt. If the tilt angle is greater than the entered value, a rollover event is detected. Default value: 70°
Max Z-axis angle	The maximum allowed Z-axis tilt. If the tilt angle is greater than the entered value, a rollover event is detected. Default value: 70°

☒ Rollover detection enabled










Rollover detection
 

Duration  ms
 Max X-axis angle  deg
 Max Y-axis angle  deg
 Max Z-axis angle  deg

Close

- Enable **Rollover detection** IO parameters in **IO settings** to register rollover events.

## Accident Reconstruction

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
														

### Purpose

The accident reconstruction is used to collect data about the car accident.

### How it works

This functionality records accelerometers and GNSS speed values before and after the accident.

## Activation

Click **Options** in the **Impact detection** section.

1. Tick the **Accident reconstruction enabled** checkbox to enable the functionality.
2. Configure **Rollover detection** parameters according to your needs:

ACC	<p>Set at which frequency and duration before and after the accident the accelerometer's measurements will be recorded.</p> <p>Default value:</p> <p><b>Frequency:</b> 100 Hz</p> <p><b>Duration before:</b> 15 s</p> <p><b>Duration after:</b> 15 s</p>
GNSS	<p>Set at which frequency and duration before and after the accident the GNSS speed values will be recorded.</p> <p>Default value:</p> <p><b>Frequency:</b> 10 Hz</p> <p><b>Duration before:</b> 30 s</p> <p><b>Duration after:</b> 30 s</p>

☒ Accident reconstruction enabled

Accident reconstruction

	Frequency	Duration before	Duration after
ACC	100	15	15
GNSS	10	30	30

Accident reconstruction will work in ALL profiles.

3. Enable **Accident reconstruction** IO parameter in **IO settings** to register accident events.

## Movement Sensor Sensitivity

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

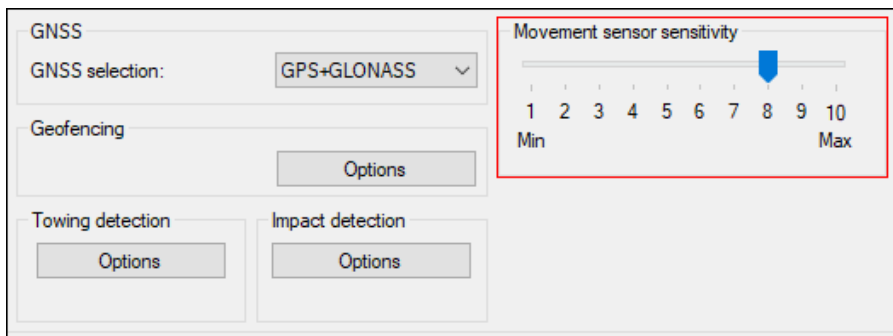
Movement sensor sensitivity is used in vehicle movement and engine status detection.

It can be configured using the slider in the **Global** settings in the main window.

- If you slide the bar towards *Max*, the sensor will detect very slight movements
- If you slide the bar towards *Min*, the sensor will only detect significant movements



The optimal sensitivity depends on the type of vehicle and how it is used.



GNSS  
GNSS selection: GPS+GLONASS

Geofencing  
Options

Towing detection  
Options

Impact detection  
Options

Movement sensor sensitivity  
1 2 3 4 5 6 7 8 9 10  
Min Max

## 1.8 Profile Settings

This part of the configuration describes how to configure various functionalities based on the **Profile** settings. Each of the four profiles is a set of settings for specific circumstances. For example, one profile can be used when the vehicle is operated in the native country and a different one can be used when it is abroad.

The FM device will switch to a different profile if one of the following conditions is met:

- An IO parameter with an active **Switch to** setting is triggered.

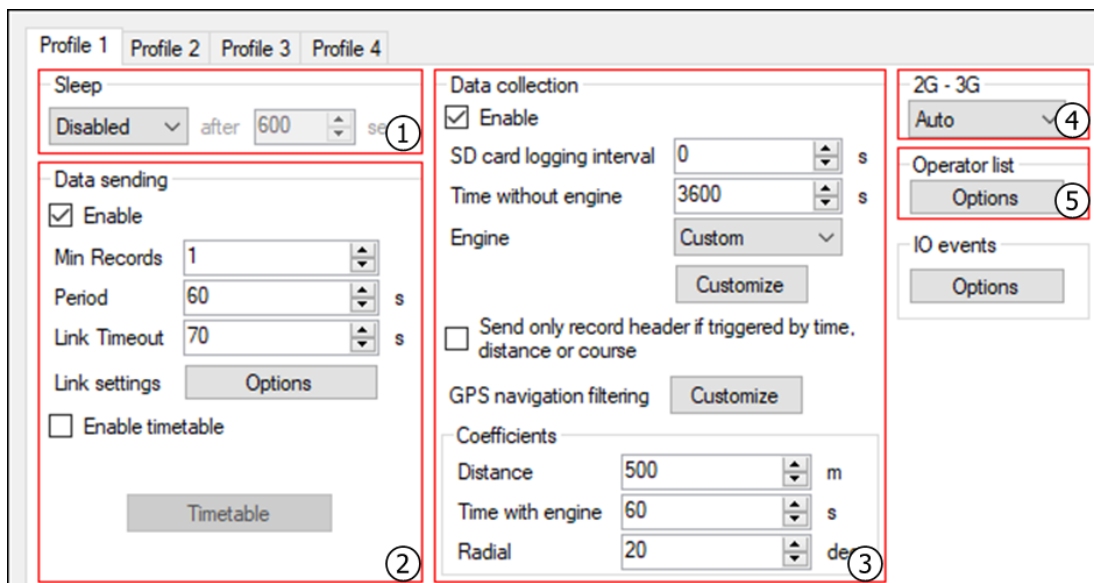
More information can be found in the [IO Parameters](#) chapter.

- No suitable operators are found in the operator list in the current profile.

More information can be found in the [Operator List](#) chapter.

This chapter contains the following functionalities and their configuration settings:

1. Sleep mode
2. Data sending
3. Data collection
4. Cellular network settings (2G-3G)
5. Operator list



The screenshot displays the 'Profile 1' settings interface. It is divided into several sections, each with a red box and a circled number indicating a specific functionality:

- 1. Sleep:** Includes a dropdown menu set to 'Disabled' and a numeric input field set to '600' with a unit of 's'.
- 2. Data sending:** Includes a checked 'Enable' checkbox, 'Min Records' set to '1', 'Period' set to '60' s, 'Link Timeout' set to '70' s, a 'Link settings' button, an 'Options' button, an unchecked 'Enable timetable' checkbox, and a 'Timetable' button.
- 3. Data collection:** Includes a checked 'Enable' checkbox, 'SD card logging interval' set to '0' s, 'Time without engine' set to '3600' s, 'Engine' set to 'Custom' with a 'Customize' button, an unchecked checkbox for 'Send only record header if triggered by time, distance or course', 'GPS navigation filtering' with a 'Customize' button, and a 'Coefficients' section with 'Distance' set to '500' m, 'Time with engine' set to '60' s, and 'Radial' set to '20' degrees.
- 4. 2G - 3G:** Includes a dropdown menu set to 'Auto'.
- 5. Operator list:** Includes a button labeled 'Options'.

At the bottom right, there is an 'IO events' section with an 'Options' button.

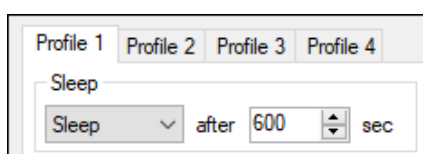


## Sleep Mode

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Different sleep modes are used to manage the power consumption of the tracking device to extend the battery's state of charge. The following sleep modes and settings are available:

Disabled	The tracking device is not in sleep mode and operates normally.
Sleep	This mode turns off GPS/GSM modems. Unavailable for Trace5 and FM-Plug4 (4th generation devices only).
Deep sleep	This mode turns off GPS/GSM modems and disables the advanced peripherals (1-Wire, CANs, Serial Ports, K-Line) (4th generation devices only).
Custom	If enabled, functionalities that should work during sleep can be selected.  More information: <a href="#">Configurable sleep</a>
Sleep timeout	If <i>Sleep</i> , <i>Deep sleep</i> , or <i>Custom</i> mode is selected, the timeout period can be modified. Once it runs out, the configured sleep mode will be activated if there are no unsent records. The entered timeout doubles if the device has unsent records and afterward, the sleep mode is activated in any case.  Default value: 600 s
Advanced	Advanced sleep mode allows achieving the lowest possible power consumption. If enabled, all device operations are suspended and it remains in this state until one of the configured triggers takes place. No record generation is possible while in this sleep mode.  This option is available for Trace5 (excluding the pre-revision Trace5-LTM) and HCV5 Lite/Pro5 Lite devices.  More information: <a href="#">Configurable sleep</a>



There are some exceptions when the tracking device will not go to sleep:

### **Sleep and custom sleep**

- If the **Engine** detection is set to *Always on* in the **Data collection** section
- If the DIN state is High (value = 1)
- If the Garmin peripheral is connected and turned on
- Any of the triggered IO events that are set on the *High* priority will wake up the device
- When the tracking device is connected via a USB cable
- When the tracking device is configured for a profile switch

### **Advanced Sleep**

- *Custom* condition selected for **Engine** condition
- *OR* condition selected for **Custom Ignition**
- *Power supply voltage* and *GPS speed* ignition sources disabled
- Accident detection, Rollover detection disabled
- Custom engine source in Eco-Drive disabled

There are some conditions that will wake up the device:

### **Sleep and custom sleep**

- A high priority event is triggered
- Configured engine state status is changed to **ON**
- The *Sleep timer* IO parameter's configured time is exceeded
- When a USB cable is inserted into the tracking device

### **Advanced Sleep**

- When a USB cable is inserted into the tracking device
- Configurable conditions for this sleep mode

## Data Sending

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

These settings allow configuring the frequency and conditions of the data that is sent to the server.

The **Enable** checkbox has to be ticked in order to enable the configured **Data sending** parameters. The checkbox is ticked by default. The following parameters can be configured:

Min Records	The minimum number of records that are required to establish a connection to the server. Default value: 1
Period	How often the device will check for the <b>Min Records</b> parameter. Default value: 60 s
Link Timeout	For how long the device will keep the link before closing it, after the connection was successfully established. Default value: 7 s

Click **Link settings** to configure the following settings between the tracking device and the server:

Constant link	If enabled, the link between the tracking device and the server is always open. Default value: <i>Disabled</i>
TCP Keep alive	If enabled, special keep-alive packets will be sent periodically if there is no data being sent. Therefore, the device will be accessible via GPRS all the time. Available only, if the <i>TCP</i> protocol is used. Default value: <i>Disabled</i>
Idle	How often keepalive packets are sent.

	Default value: 300 s
Interval	How often keepalive packets are resent if they are not sent successfully. Default value: 10 s
Heartbeat	If enabled, keeps an open socket on the server-side by sending the GPRS command 16/116 after the set time period has passed since the last packet was sent. Default value: <i>Disabled</i>
Interval	How often heartbeat packets are sent. Default value: 240 s



If **Constant link** is enabled, the device ignores the link timeout parameter for the main connection and uses it only for the emergency connections.



The **Constant link** and **Heartbeat** functionalities do not work with the second server if the **Two Servers** mode is used.

You should note, that for the BG96 (LTE Cat M1 devices) modem the TCP Keepalive settings are a bit different than devices with M95 or MC60 modems (2G devices), or UG96 modems (3G devices). The differences are defined in the table below:

	M95/MC60	UG96	BG96
Idle time range	1-1800 seconds	60-7200 seconds	1-120 minutes
Interval time range	10-20 seconds	30-100 seconds	25-100 seconds

Therefore, for applicable devices the configurator allows to set the value with the following ranges:

- Idle time: 60 - 7200 seconds (default time – 300 seconds)
- Interval time: 10 - 100 seconds (default time – 10 seconds)



**TCP Keepalive** will work with 3G devices only from the A10 modem firmware version. This functionality will not work with the FM-Eco4 light 3G variant.



For the LTE Cat M1 devices, the idle time is set in minutes.



If the idle time is set to more than 1800 s for 2G devices, the device will set the idle time to 1800 s. If the interval time value is set more than 20 s, the device will set the time to 20 s.



If the interval time value is set to less than 30 s for 3G devices, the device will set the time to 30 s.



If the interval time value is set to less than 25 s for LTE Cat M1 devices, the device will set time to 25 s.



After enabling the TCP keepalive functionality, for the devices with BG96 modem, we recommend a restart, as the link with a server should be closed to TCP keepalive start working.

Tick the **Enable timetable** checkbox and click **Timetable** to set at what days and hours can data be sent. The device will connect to GPRS only during the set days and hours.



If the **Enable timetable** checkbox is ticked and none of the days are checked, the device will never connect to GPRS and will be reachable only via SMS commands.

The screenshot displays the Ruptela configuration interface. At the top, there are tabs for Profile 1, Profile 2, Profile 3, and Profile 4. The main area is divided into several sections. On the left, the 'Data sending' section is highlighted with a red box. It contains a 'Data sending' header, a checked 'Enable' checkbox, and three input fields: 'Min Records' set to 1, 'Period' set to 60 s, and 'Link Timeout' set to 7 s. Below these is a 'Link settings' section with an 'Options' button. At the bottom of this section is a 'Timetable' button. In the center, the 'Data collection' dialog box is open, and its 'Link status' section is highlighted with a red box. This section contains three checked checkboxes: 'Constant link', 'TCP Keepalive' (with 'Idle' set to 300 s and 'Interval' set to 10 s), and 'Heartbeat' (with 'Interval' set to 240 s). To the right of the dialog box, there are several other settings: '2G - 3G' set to 'Auto', 'Operator list' with an 'Options' button, and 'IO events' with an 'Options' button. At the bottom of the main interface, there are two more input fields: 'Time with engine' set to 60 s and 'Radial' set to 60 deg.

## Data Collection

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

These settings allow configuring the frequency and conditions of the data that is collected.

The **Enable** checkbox must be ticked to configure **Data collection**. The checkbox is ticked by default.

The following parameters can be configured:

SD card logging interval	<p>How often the data is logged to the SD card. If the value is 0, the SD card only stores records. If the value is above 0, the SD card logs data.</p> <p>Available for: HCV5, LCV5, Pro5, FM-Tco4 HCV, FM-Tco4 LCV, FM-Pro4</p> <p>Default value: 0</p>
Time without engine	<p>Determines how often records are made when the engine is off.</p> <p>Default value: 60 s</p>
Engine	<p>How the device detects whether the engine is turned on.</p> <ul style="list-style-type: none"> <li>• <i>Always on</i> – considers that ignition is always turned on.</li> <li>• <i>Ignition (DIN4)</i> – DIN4 is used for detection (unavailable for Trace5 and FM-Plug4)</li> <li>• <i>MovSensor</i> – the engine is considered to be on when movement is detected</li> <li>• <i>Power voltage</i> – the voltage on pin 16 of the OBD socket is used for detection (FM-Plug4 only)</li> <li>• Auto - detects ignition automatically (Plug5 only) More information: <a href="#">Auto Ignition</a></li> <li>• <i>Custom</i> – configure your engine detection conditions. More information: <a href="#">Custom Ignition</a></li> </ul> <p>Default value: <i>Always On</i></p>
Send only record header if triggered by time, distance or course	<p>If enabled, sends only the record header to reduce the data consumption. The record header contains only basic time, position and speed data.</p>

GPS navigation filtering	Used to eliminate inaccurate GPS coordinates. This functionality can be enabled and modified by clicking the <b>Customize</b> button.  More information: <a href="#">Configurable navigation filtering</a>
Coefficients	Used to collect records in addition to other parameters for a more accurate vehicle route. A record will be made when: <ul style="list-style-type: none"> <li>• <b>Distance</b> is reached Default value: 1000 m</li> <li>• <b>Time with engine</b> has passed Default value: 60 s</li> <li>• <b>Radial</b> tilt is reached Default value: 60°</li> </ul>

Profile 1
Profile 2
Profile 3
Profile 4

Sleep  
Disabled after 600 sec

Data sending  
☒ Enable  
Min Records 1  
Period 60 s  
Link Timeout 7 s  
Link settings Options  
☐ Enable timetable  
Timetable

Data collection  
☒ Enable  
SD card logging interval 0 s  
Time without engine 60 s  
Engine Always on  
☐ Send only record header if triggered by time, distance or course  
GPS navigation filtering Customize















Coefficients  
Distance 1000 m  
Time with engine 60 s  
Radial 60 deg

2G - 3G  
Auto

Operator list  
Options

IO events  
Options

## Data Collection to SD Card

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
													

The SD card can store temporarily the tracking device records, or it can log the data. When the SD card stores the records, they are sent to a server via special command. When the data is logged, it must be retrieved by request via another command.



The SD card must be formatted with the FAT32 (File Allocation Table32) file system.

















If the record data is present in the SD card, the logging will not start, until records are sent to a server.



If there are logs in the SD card, then the record data will not be stored there.

## Cellular Network Settings

### GSM/UMTS Network

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
													

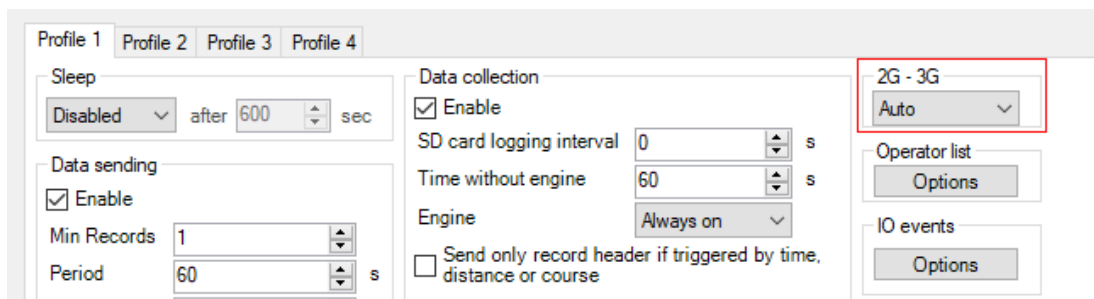
The **2G-3G** section allows setting the cellular network type for the tracking device if its modem supports the UMTS (3G) network. Three different operation modes can be set:



2G-3G	<p>Possible values:</p> <ul style="list-style-type: none"> <li><i>Auto</i> – the device will use the 3G network when it is available. If 3G is unavailable, the device automatically switches to 2G mode. Once 3G is available again, it will switch back to 3G mode automatically.</li> <li><i>GSM only</i> – the device operates only in 2G mode.</li> <li><i>UMTS only</i> – the device operates only in 3G mode.</li> </ul> <p>Default value: <i>Auto</i></p>
-------	---



If the tracking device does not have a modem that supports 3G, this option will have no effect.



The screenshot shows the 'Profile 1' configuration page. The '2G - 3G' dropdown menu is highlighted with a red box and set to 'Auto'. Other visible settings include 'Sleep' (Disabled, after 600 sec), 'Data collection' (Enabled, SD card logging interval 0 s, Time without engine 60 s, Engine Always on), 'Data sending' (Enabled, Min Records 1, Period 60 s), 'Operator list' (Options button), and 'IO events' (Options button).

## GSM/UMTS/LTE Network

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗

The **Network technology configuration** section allows you to select between the 2G, 3G, LTE Cat M1, LTE Cat1 and NB-IoT networks. Four different operation modes can be set:

Network technology	<p>Possible values:</p> <ul style="list-style-type: none"> <li><i>Auto</i>: <ul style="list-style-type: none"> <li>2G device – the device will operate in 2G mode.</li> <li>3G device – the device will use the 3G network when it is available. If 3G is unavailable, the device automatically switches to 2G mode. Once 3G is available again, it will switch back to 3G mode automatically.</li> </ul> </li> </ul>
--------------------	---

	<ul style="list-style-type: none"> <li>○ LTE device – the device will use the LTE Cat M1/NB-IoT or the LTE Cat1 network when it is available. If LTE connectivity is unavailable, the device automatically switches to 2G mode. The device will switch back to LTE mode only after reaching no 2G signal zone or after reset.</li> <li>• <i>GSM</i>: The device operates only in 2G mode.</li> <li>• LTE only: <ul style="list-style-type: none"> <li>○ <i>Cat M1/Cat1 only</i>: The device operates only in LTE Cat M1/Cat1 mode.</li> <li>○ <i>NB-IoT only</i>: The device operates only in NB-IoT mode.</li> </ul> </li> </ul> <p>In this operation mode, you can enable the <b>Emergency network switch</b> checkbox, which allows the device to fall back to the <i>Auto</i> mode for 30 minutes if the device did not succeed to connect to the GPRS in the last 12 hours.</p> <p>Default value: <i>Auto</i>.</p>
--	---

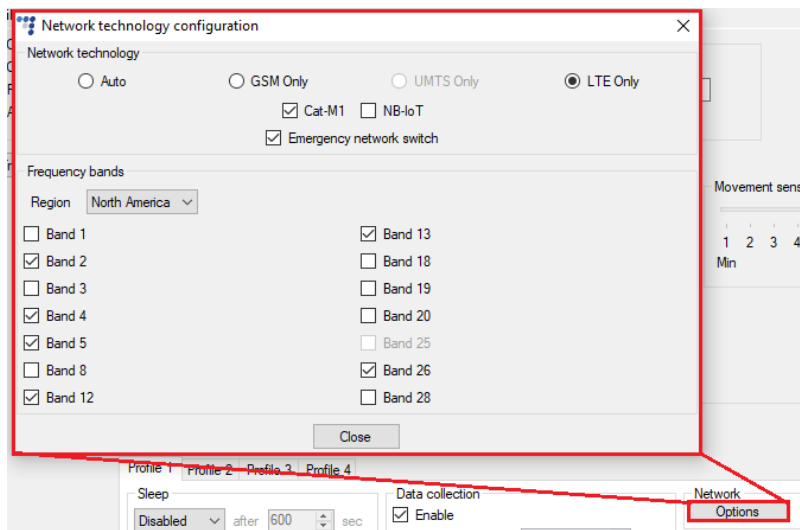
You can also enable the required frequency bands for the LTE Cat M1/Cat1 and NB-IoT networks. Select a geographic location from the **Region** section, and the configurator will automatically check the applicable checkboxes. If you want to enable the required frequency bands manually, select *Custom*.



We do not recommend using the NB-IoT network with moving objects, as it is designed for use with stationary objects.



We strongly recommend you use only those bands, which belong to the region, where the tracking device is used. Enabling unnecessary bands will decrease the performance of the tracking device.



## Operator List

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

The **Operator list** functionality allows configuring the operator acquisition settings. The following settings can be configured:

GPRS Attempt	How many times the device will try to connect to GPRS before trying a different operator.  Default value: 2
GPRS data counter	How many bytes of data the device will send before searching for other GPRS operators.  Default value: 1000
Temporary blacklist	For how long the operator with an unavailable GPRS is banned. This prevents the FM device from connecting to this operator during the next operator search. The operator is banned after not responding to 3 consecutive ping requests. The blacklist is cleared after resetting the device.

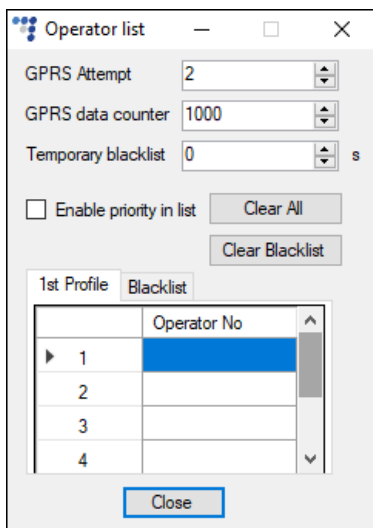
	Default value: 0 s
Enable priority in list	If enabled, searches for the operators according to their number in the list. If disabled, the device will search for a random operator.  Default value: <i>Disabled</i>
<b>Profile tab</b>	Operators used in the current profile are entered here. If the listed operator was not found, the device will search for the next one in the list. The device will switch to the next available profile if no operators were found.
Blacklist	The operators entered in the blacklist will be ignored during the operator search.



A single blacklist is used for all profiles, but each profile has a different operators list.

Click **Clear All** to clear all operators from the current profile operator list.

Click **Clear Blacklist** to clear all operators from the blacklist.



The dialog box titled "Operator list" contains the following elements:

- Input fields for "GPRS Attempt" (value: 2), "GPRS data counter" (value: 1000), and "Temporary blacklist" (value: 0 s).
- A checkbox for "Enable priority in list" which is currently unchecked.
- Two buttons: "Clear All" and "Clear Blacklist".
- Two tabs: "1st Profile" and "Blacklist". The "1st Profile" tab is active.
- A table with the following structure:
 

	Operator No
▶ 1	
2	
3	
4	
- A "Close" button at the bottom.

## 1.9 IO Parameters

### Profile Settings Peripherals and Interfaces

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

After configuring the needed interfaces, you need to enable IO parameters for the selected interfaces.

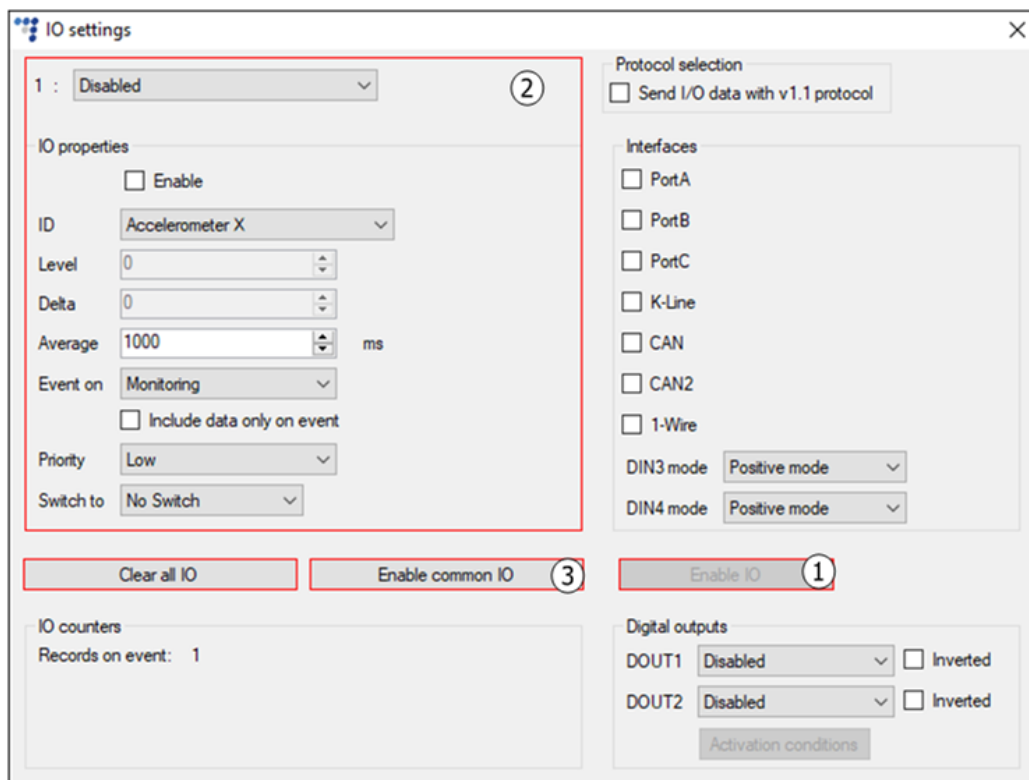
There are three methods to enable IO parameters:

1. Using the **Enable IO** functionality (recommended).
2. Enabling IO parameters manually.
3. Automatically enabling the commonly used (predefined) IO parameters.



We highly recommend using the **Enable IO** functionality to instantly enable all IOs for selected interfaces and significantly reduce configuration time. This requires the extended protocol to be enabled.

Also, all enabled IO parameters can be disabled by clicking the **Clear all IO** button.



The screenshot shows the 'IO settings' window with the following elements:

- Protocol selection:** A checkbox for 'Send I/O data with v1.1 protocol'.
- Interfaces:** A list of checkboxes for PortA, PortB, PortC, K-Line, CAN, CAN2, and 1-Wire. Below this are dropdowns for 'DIN3 mode' and 'DIN4 mode', both set to 'Positive mode'.
- Digital outputs:** Two dropdowns for 'DOUT1' and 'DOUT2', both set to 'Disabled'. Each has an 'Inverted' checkbox.
- IO properties (highlighted with a red box and circled 2):** Includes an 'Enable' checkbox, an 'ID' dropdown (set to 'Accelerometer X'), 'Level' and 'Delta' spinners (both at 0), an 'Average' spinner (set to 1000 ms), an 'Event on' dropdown (set to 'Monitoring'), an 'Include data only on event' checkbox, a 'Priority' dropdown (set to 'Low'), and a 'Switch to' dropdown (set to 'No Switch').
- Buttons (highlighted with red boxes and circled 1, 2, 3):** 'Clear all IO' (circled 1), 'Enable common IO' (circled 2), and 'Enable IO' (circled 3).
- IO counters:** A section showing 'Records on event: 1'.

**i** A total of 80 IO parameters (40 for Eco4, Eco4 S/T and Plug4) can be enabled at a time.

## Enable IO

It is used to enable all IO parameters for the selected interfaces with the default and recommended IO properties for each enabled interface. This feature significantly reduces the configuration time. However, it requires the extended protocol to be enabled and cannot be used with some interface modes.

To enable IO parameters using **Enable IO**, follow these steps:

1. Tick the **Send I/O data with v1.1 protocol** checkbox (for 5<sup>th</sup> gen devices enabled in the background).
2. Configure interfaces, modes and additional parameters according to your needs.
3. Click **Enable IO**. A new **Configured IO** window will appear.
4. Select which IO parameters to enable.
5. Click **Save**.
6. Optionally, properties for each IO parameter can be configured manually.

The screenshot shows the 'IO settings' window with several components and numbered callouts:

- Callout 1:** Points to the 'Protocol selection' section where the checkbox 'Send I/O data with v1.1 protocol' is checked.
- Callout 2:** Points to the 'Interfaces' section, which lists various ports (Port A, Port B, Port C, K-Line, CAN, CAN2, 1-Wire) and their configured parameters like 'Fatigue sensor', 'RFID reader', 'J1708 + DTC', 'Tacho read', 'Trailers', 'LCV', and 'DS1971'.
- Callout 3:** Points to the 'Enable IO' button at the bottom of the main settings panel.
- Callout 4:** Points to the 'Configured IO' dialog box, which shows a list of 40 IO parameters (e.g., TCO first driver ID, TCO second driver ID, CAN high resolution engine total fuel used) that can be selected or deselected.
- Callout 5:** Points to the 'Save' button at the bottom of the 'Configured IO' dialog box.
- Callout 6:** Points to the 'IO properties' section for a selected parameter (TCO first driver ID), showing fields for ID, Level, Delta, Average, Event on, Priority, and Switch to.

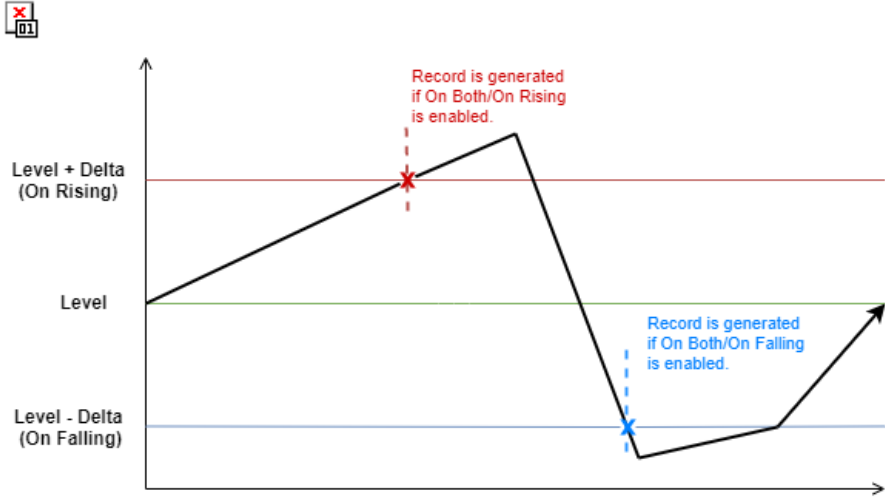
## Enabling IO Parameters Manually

This method requires you to enable each IO parameter and configure all properties manually.

Follow these steps to enable IO parameters:

1. Configure interfaces, modes, and additional parameters according to your needs.
2. Select a slot for the IO parameter.
3. Tick the **Enable** checkbox in the **IO properties** section to use the selected slot.
4. Configure the following **IO properties** for each IO parameter.

ID	Select a parameter from the drop-down list to enable it in the selected slot. Only one parameter can be enabled in a slot at a time.
Level	Used with the <b>Event On Hysteresis</b> mode to set a reference value.  Default value: 0
Delta	Used with the <b>Event On Hysteresis</b> mode as a maximum possible value deviation from the referenced <b>Level</b> value.  Default value: 0
Average (Debounce)	Some parameter values tend to change rapidly and do not correspond with any valuable information. The averaging of values for a period gives more reliable and accurate information.  Some IO parameters have a <b>Debounce</b> parameter instead of <b>Average</b> . Debounce defines for how long the device must receive the changed state of an IO to register the new state.  Default value: 1000 ms
Event on	Defines the logic of when an IO event is generated. <ul style="list-style-type: none"> <li>• <i>Monitoring</i> – the parameter value is monitored and sent with every record.</li> <li>• <i>Change</i> – the parameter value is monitored and sent with every record. Moreover, when the value changes, a record will be generated.</li> <li>• <i>Hysteresis</i> – a record is generated when the <b>Level</b> parameter value deviates by more than the set <b>Delta</b> value. Additional settings are available to define when the record should be generated:</li> </ul>

	<ul style="list-style-type: none"> <li>○ <i>On Both</i> – a record is generated when the parameter value deviates by either rising or falling more than the set <b>Delta</b> value.</li> <li>○ <i>On Rising</i> – a record is generated when the parameter value deviates by rising more than the set <b>Delta</b> value.</li> <li>○ <i>On Falling</i> – a record is generated when the parameter value deviates by falling more than the set <b>Delta</b> value.</li> </ul> <p>Example for <i>Hysteresis</i>: If the <b>Level</b> is set to 120 and the <b>Delta</b> value is set to 30, and <i>On Both</i> is selected, then an event will be generated when the parameter value falls below 90 or rises above 150 (<math>120 \pm 30</math>).</p>  <p>Default value: <i>Monitoring</i></p>
Include data only on event	<p>If enabled, includes the parameter value in records only when the <i>Change</i> or <i>Hysteresis</i> condition is met.</p> <p>Default value: <i>Disabled</i></p>
Priority	<p>Used to determine the importance of IO parameter value changes.</p> <ul style="list-style-type: none"> <li>• <i>High</i> – if <i>Change</i> or <i>Hysteresis</i> conditions are met, the record is sent immediately, disregarding the data sending settings.</li> <li>• <i>Low</i> – if <i>Change</i> or <i>Hysteresis</i> conditions are met, the device will wait for suitable conditions to open a link to the server to send records.</li> </ul> <p>Default value: <i>Low</i></p>



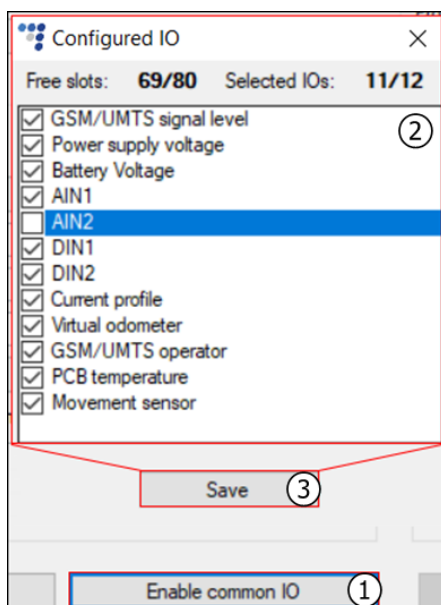
Switch to	Used to switch to another profile if the <i>Change</i> or <i>Hysteresis</i> conditions are met.  Default value: <i>No switch</i>
-----------	--

## Using Enable Common IO

It is used to automatically enable the most commonly used IO parameters.

Follow these steps to enable them:

1. Click **Enable common IO** in the **IO settings** window. A new **Configured IO** window will appear.
2. Select which of the 12 (10 for the Eco4 RS T series) common IO parameters to enable.
3. Click **Save**.
4. Optionally, properties for each IO parameter can be configured manually.
5. Optionally, other parameters can also be enabled before using the **Enable common IO** method.



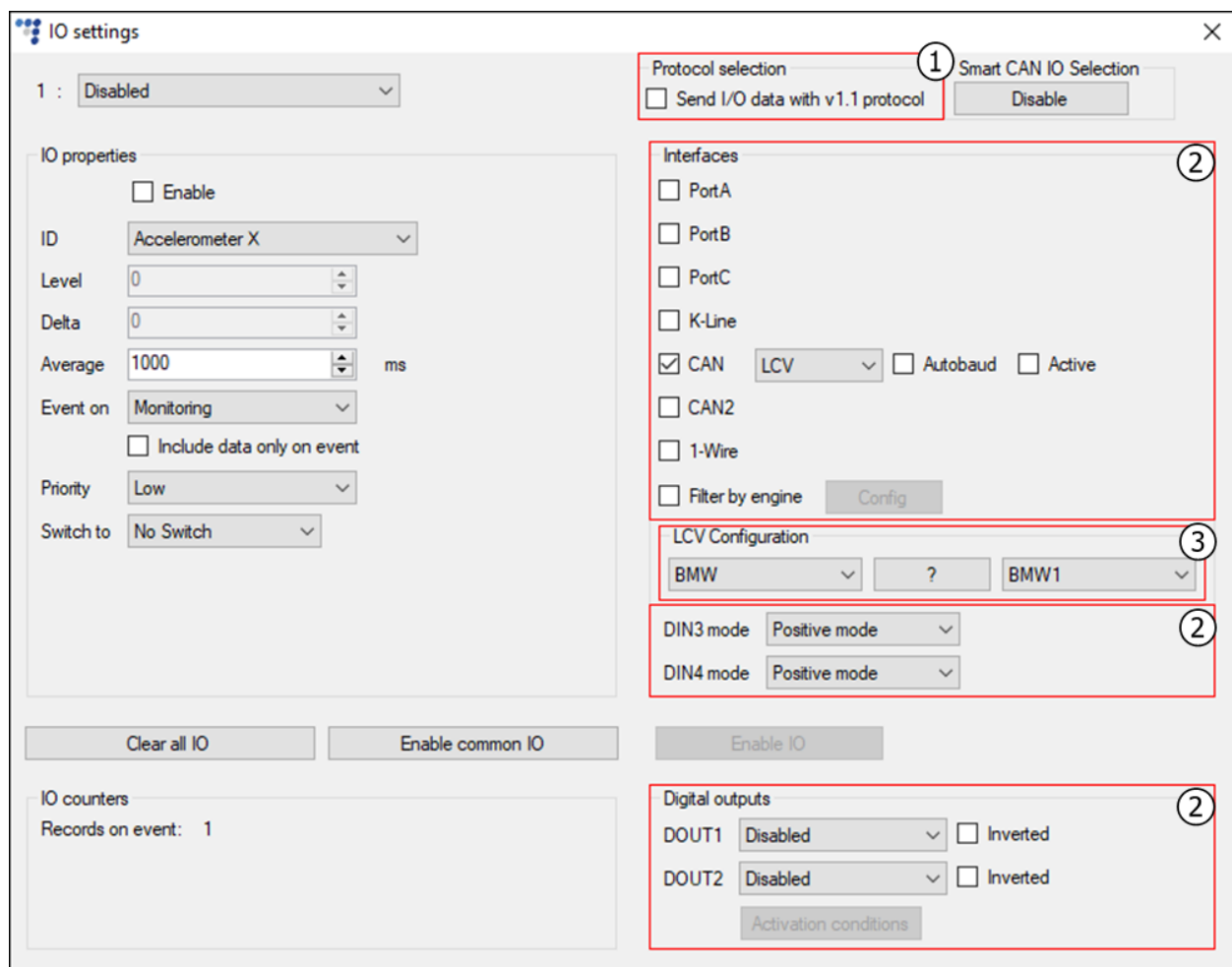
## 1.10 Peripherals and Interfaces

This part of the configuration describes how to configure various peripherals and interfaces that are connected to the device physically. Peripherals and interfaces work under the logic of the profiles; thus, profiles can be switched once the input or the output of the interface is triggered and meets the configured conditions.

Configure which interfaces and peripherals will be active and how they behave. Click the **Options** button in the **IO events** section.

This chapter contains the following functionalities and their configuration settings:

1. Selection of the extended protocol
2. Various interfaces
3. Light commercial vehicle configuration



The screenshot shows the 'IO settings' window with the following configuration details:

- Protocol selection (1):** A red box highlights the 'Protocol selection' section, which includes a checkbox for 'Send I/O data with v1.1 protocol' and a 'Smart CAN IO Selection' button with a 'Disable' option.
- Interfaces (2):** A red box highlights the 'Interfaces' section, which includes checkboxes for 'PortA', 'PortB', 'PortC', 'K-Line', 'CAN' (checked), 'CAN2', and '1-Wire'. The 'CAN' checkbox is selected, and the 'LCV' dropdown is set to 'LCV'. There are also checkboxes for 'Autobaud' and 'Active', and a 'Filter by engine' button with a 'Config' option.
- LCV Configuration (3):** A red box highlights the 'LCV Configuration' section, which includes a dropdown for 'BMW' and a 'BMW1' dropdown.
- DIN3 mode (2):** A red box highlights the 'DIN3 mode' dropdown, which is set to 'Positive mode'.
- DIN4 mode (2):** A red box highlights the 'DIN4 mode' dropdown, which is set to 'Positive mode'.
- Digital outputs (2):** A red box highlights the 'Digital outputs' section, which includes dropdowns for 'DOUT1' and 'DOUT2', both set to 'Disabled', and checkboxes for 'Inverted'.

Other visible settings include:

- IO properties:** '1 : Disabled' dropdown, 'Enable' checkbox, 'ID: Accelerometer X' dropdown, 'Level: 0' dropdown, 'Delta: 0' dropdown, 'Average: 1000' dropdown, 'Event on: Monitoring' dropdown, 'Include data only on event' checkbox, 'Priority: Low' dropdown, 'Switch to: No Switch' dropdown.
- Buttons:** 'Clear all IO', 'Enable common IO', 'Enable IO'.
- IO counters:** 'Records on event: 1'.

## Extended Protocol

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

There is only one setting in the **Protocol Selection** section. The **Send I/O data with v1.1 protocol** is an extended data transmission protocol. Some of the IO parameters require this protocol to be enabled to work properly. Otherwise, these parameters will not be available for the selection.

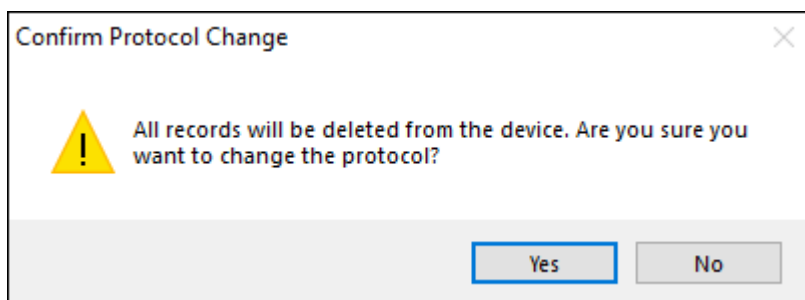


We highly recommend to always keep the extended protocol enabled.

To enable the extended protocol functionality, tick the **Send I/O data with v1.1 protocol** checkbox.



The **Confirm Protocol Change** dialogue window will appear, that all unsent records will be deleted from the device. Click **Yes** to enable the protocol.




If the extended protocol is enabled, the Enable IO functionality can be used to instantly enable all IOs for the selected interfaces and significantly reduce configuration time.



5<sup>th</sup> generation devices use the v1.1 protocol by default.

## Serial Port Interfaces

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4 HCV	Tco4 LCV	Pro4	Eco4	Eco S/T	Plug4	
✓	✓	✓	✓	✗	✗	✓	✓	✓	✓	✗	Eco4 RS T only	✗	

Serial ports are used to connect and communicate with various peripheral devices.

The following tables display the compatibility of the peripherals and devices and which serial port can be configured.

5th Generation	HCV5	LCV5	HCV5 Lite/Pro5 Lite	Pro5
DFS RS232				
RFID reader				
Alcohol sensor				
Magnetic card reader		Port A/ Port B (RS232)		Port A/ Port B (RS232)
LED display				
UHF-RFID reader				
Fatigue sensor				
Camera				
TCO card reader				-
Optitemp				-
Weighting system				-
Carrier Vector 1550				-
TK Touchprint				-
Spreader				
IQ Freeze	-	-		Port A/ Port B (RS232)
Kimax weight sensor	-	-		
CANLog	-	-		
Garmin		Port B (RS232)		
TK		-		-
DFS RS485		Port C (RS485)		
J1708		-		
J1708 + DTC		-		-
Transparent channel		Any port		



**HCV5-Lite/Pro5-Lite** supports one of the following interfaces at a time: RS232, RS485 or K-line.

4th Generation	Tco4 HCV	Tco4 LCV	Pro4	Eco4 RS T
DFS RS232				
RFID reader				
Alcohol sensor				
Magnetic card reader		Port A/ Port B (RS232)		Port A (RS232)
LED display				
UHF-RFID reader				
Fatigue sensor				
Camera				-
TCO card reader		-	-	-
Optitemp		-	-	-
Weighting system		-	-	-
Carrier Vector 1550		-	-	-
TK Touchprint		-	-	-
Spreader		-		-
IQ Freeze	-	-	Port A/ Port B (RS232)	-
Kimax weight sensor	-	-		-
CANLog	-	-		-
Garmin		Port B (RS232)		-
TK		-	-	-
DFS RS485		Port C (RS485)		-
J1708		-		-
J1708 + DTC		-	-	-
Transparent channel		Any port		

## K-Line Interface

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4 HCV	Tco4 LCV	Pro4	Eco4	Eco S/T	Plug4	
❌	✅	✅	❌	✅	❌	✅	✅	✅	❌	❌	❌	✅	

The K-Line interface is used to read tachograph data in heavy vehicles. It can also be used to read parameters and diagnostic trouble codes via the OBD2 socket in light vehicles.

K-Line	<p>If turned on, data will be read via the K-Line interface.</p> <p>Default value: Off</p>
Mode	<p>K-Line interface working mode. Possible values for different devices:</p> <p><b>HCV5 and FM-Tco4 HCV</b></p> <ul style="list-style-type: none"> <li>• <i>TCO</i> – used for driver information reading from the back of the tachograph</li> <li>• <i>OBD</i> – CAN data reading via the OBD2 socket</li> <li>• <i>Tacho read</i> – used to read tachograph data. Works only with specific tachographs and if a frontal connection is used</li> </ul> <p>Default value: <i>TCO</i></p> <p><b>HCV5 Lite/Pro5 Lite</b></p> <ul style="list-style-type: none"> <li>• <i>TCO</i> – used for driver information reading from the back of the tachograph</li> <li>• <i>Tacho read</i> – used to read tachograph data. Works only with specific tachographs and if a frontal connection is used</li> </ul> <p><b>LCV5, FM-Tco4 LCV, FM-Plug4 and Plug5</b></p> <ul style="list-style-type: none"> <li>• <i>OBD</i> – CAN data reading via the OBD2 socket</li> </ul>

If *TCO* mode is used, sometimes invalid CRC values might be received in the data packets. One of the following invalid CRC values elimination methods can be selected from the drop-down list:

- *Discard data* – packets with invalid CRC values will be discarded. In this case, new records contain previously obtained K-Line data (from data packets that had a good CRC value).
- *Put FF values* – the device will put FF (255) values.

If *OBD* mode is used, diagnostic trouble codes reading **DTC** will be enabled by default. Reading time intervals and fuel type can be specified. These codes are sent as a separate command and not as an IO parameter.



For FM-Plug4, it is not recommended to use the K-Line and CAN interfaces at the same time.

## CAN Interfaces

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4

CAN interfaces are used to get various data from vehicle on-board systems.

Each CAN mode can be activated on any CAN port. The interface must be physically connected to the same CAN port as it is configured.

Interfaces	HCV5/Tco4	HCV LCV5/Tco4	LCV HCV5 Lite/Pro5	Lite Pro5/Pro4	Plug4	Plug5
FMS	Yes	-	Yes	Yes	-	Yes
HCV	Yes	-	Yes	Yes	-	Yes
J1939 + DTC	Yes	-	Yes	Yes	-	Yes
Trailers	Yes	-	Yes	Yes	-	Yes
MobilEye	Yes	Yes	-	Yes	-	-
DXP CAN	Yes	Yes	-	Yes	-	-
LCV	Yes	Yes	Yes	-	-	Yes
OBD	Yes	Yes	Yes	-	Yes	Yes
Tacho read	Yes	-	Yes	-	-	-
OBD+LCV	HCV5	LCV5	Yes	-	-	Yes
Thermoking SLX	HCV5	-	-	PRO5	-	-



It is not recommended to use the *LCV* mode on the Tco4 HCV devices.

## CAN Interface Modes

Depending on the device, the following modes can be selected from the *CAN* drop-down list:

FMS	CAN data standard used for trucks and heavy vehicles. Recommended when the vehicle has an FMS connector. Refer to your vendor for more details.  An additional <b>Remember tachograph parameters when engine is OFF</b> checkbox appears when this mode is selected.
HCV	Used with a specific set of heavy commercial vehicles, mostly Mercedes Benz trucks.
MobilEye	Used for communication with the <a href="#">MobilEye</a> collision avoidance system.
DXP CAN	Used to read DXP electric vehicle data.
LCV	Used to read light and commercial vehicle CAN data from CANbus lines.
OBD	Used to read CAN data via the OBD2 socket.
OBD+LCV	Used to read CAN data from light and commercial vehicles, getting data from both the OBD2 socket and CANbus lines.
J1939 + DTC	Used to read diagnostic trouble codes (DTC) from the J1939 data line.
Trailers	Used to read trailer CAN parameters.  More information: <a href="#">Trailer CAN parameters</a>
Tacho read	Used to read tachograph data.
Thermoking SLX	Used to read data from Thermoking trailer reefers that use SR-2, SR-3 or SR-4 HMIs.



The screenshot shows the 'CAN Autoconfiguration' section of a software interface. At the top, there are three tabs: 'Smart CAN IO Selection' (with a 'Disable' button), 'Advanced CAN options' (with a 'Config' button), and 'CAN Autoconfiguration' (with a 'Disabled' dropdown). Below these, the 'Interfaces' section lists several options: PortA, PortB, PortC, K-Line, CAN (checked), CAN2, 1-Wire, and Filter by. The 'CAN' option is expanded, showing a dropdown menu with the following items: FMS (highlighted), LCV, OBD, Tacho read, DXP CAN, HCV, MobilEye, Trailers, J1939 + DTC, OBD+LCV, and Themoking SLX. To the right of the dropdown, there is a '250' value, a 'Calc HRFC' checkbox, an 'Active' checkbox, and a 'Discard FF values' dropdown. Below the dropdown menu, there is an 'LCV Autoselect' section with a 'Start' button and an 'Enable I/Os' checkbox. At the bottom, there is a checkbox for 'Remember tachograph parameters when engine is OFF'.

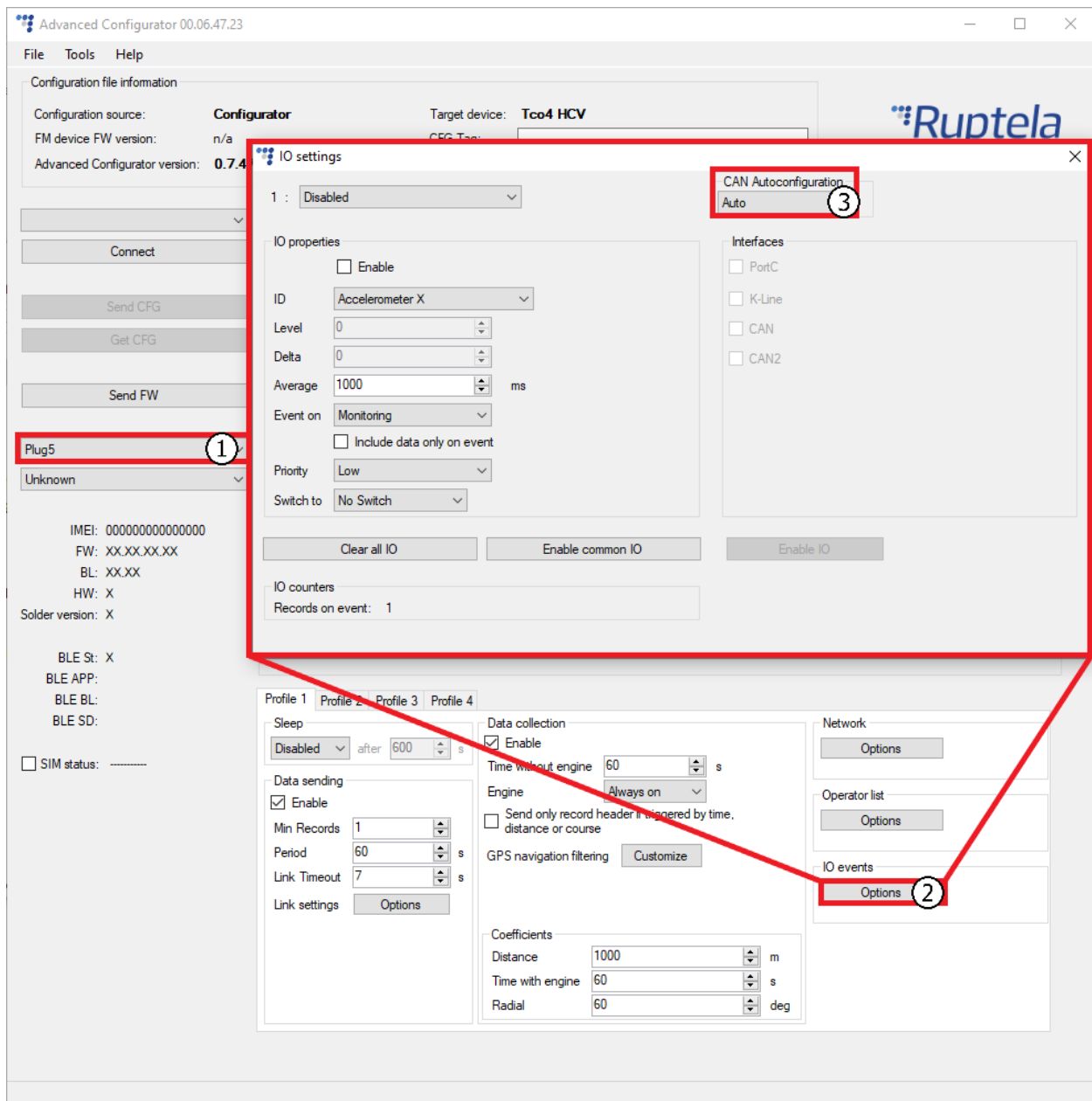
## CAN Autoconfiguration

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4

CAN Autoconfiguration function is used to detect vehicle type and connect interfaces automatically.

Navigation to CAN Autoconfiguration:

1. Select device type
2. Open Options in IO events subsection
3. Select desired option from "CAN Autoconfiguration" dropdown menu



Name	Description	Availability
Disabled	Turns off auto detection function, interfaces need to be selected manually.	HCV5, LCV5, HCV5Lite, Pro5 Lite, Plug5
Auto	Auto function is enabled, interfaces will be searched and assigned automatically.  Search order: starts detecting from heavy-duty interfaces (if there is any), uses OBD if no heavy-duty interfaces were found.	Plug5

OBD	Automatic OBD interfaces configuration according to the layout used by vehicle manufacturer or detected by harness type.	HCV5, LCV5, HCV5Lite, Pro5 Lite, Plug5
Heavy-duty	FMS and J1708 automatic configuration according to the detected interfaces on possible Pin layouts.	Plug5



For Plug5 devices it is recommended to use **Auto** function for easy configuration.



If **Disabled** option is selected, additional parameters will need to be set.

## Additional CAN Mode Parameters

Each mode has additional parameters which can be configured according to your needs. The following table displays which parameters are available for each mode:

	Baudrate	Calc HRFC	Active	FMS data filter	Filter by engine	Remember tachograph parameters when engine is OFF	Smart CAN IO selection	EasyCAN
<b>Teacho read</b>	Yes	-	-	-	-	Yes	-	-
<b>FMS</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	-
<b>HCV</b>	Yes	Yes	Yes	Yes	Yes	-	Yes	-
<b>J1939+DTC</b>	Yes	Yes	Yes	Yes	Yes	-	Yes	-
<b>LCV</b>	Yes	-	Yes	-	Yes	-	Yes	-
<b>DXP CAN</b>	Yes	-	-	-	Yes	-	Yes	-
<b>MobilEye</b>	Yes	-	-	-	-	-	-	-
<b>Trailers</b>	Yes	-	Yes	-	-	-	-	-
<b>OBD+LCV</b>	Group dependant	-	Group dependant	-	-	-	Yes	Group dependant
<b>Thermoking SLX</b>	-	-	-	-	-	-	-	-

If *OBD* mode is used, DTC reading will be enabled by default, where reading time interval can be specified. Additionally, the fuel type should be selected, as it is used in the **OBD fuel usage** parameter calculations. If the wrong fuel type is selected, then the parameter will give the wrong values. Also, you can tick the **Splitter-Harness** checkbox. In this case, the end line terminating resistor will be disabled. For more information see the [Advanced CAN Options](#) chapter. Moreover, the **OBD communication when ignition OFF** parameter can be configured after clicking **Config**.

Baudrate	<p>CAN interface data transfer speed. This requires <i>FMS, MobilEye, Trailers, J1939, Tacho Read, DXP CAN</i> to be selected as the CAN1/CAN2 mode. The required baudrate depends on the vehicle itself. Possible values:</p> <ul style="list-style-type: none"> <li>• 125</li> <li>• 250</li> <li>• 500</li> </ul> <p>Default value: <i>250</i></p>
Autobaud	<p><i>HCV, OBD+LCV, LCV</i> and <i>Tacho read</i> modes have an <b>Autobaud</b> parameter.</p> <ul style="list-style-type: none"> <li>• If enabled, the device will automatically set a correct baudrate for all used CAN lines in the vehicle.</li> </ul> <p>It is recommended to use the functionality when several CAN lines are used, and data cannot be acquired.</p> <ul style="list-style-type: none"> <li>• If disabled, the baudrate will depend on the vehicle.</li> </ul> <p>Default value: <i>Disabled</i></p>
Calc HRFC	<p>If enabled, fuel consumption will be recalculated from the fuel rate. Recalculation works only when high-resolution fuel consumption data from CANbus is not available.</p> <p>Default value: <i>Disabled</i></p>
Active	<p>If enabled, the device will send queries to the vehicle's onboard computer to ask for specific data.</p> <p>Default value: Depends on the configured mode</p>
<b>FMS data filter</b>	<p>Used to set an FMS data filter. One of the following methods can be selected from the drop-down list:</p> <ul style="list-style-type: none"> <li>• <i>Discard FF values</i> – the device will send only valid data (according to the SAE J1939 standard) to the server. It discards FMS data packets with invalid FF values. In this case, new records will contain previously obtained FMS parameters values (from valid data packets).</li> <li>• <i>No filters</i> – the device sends all data to the server.</li> </ul> <p>Default value: <i>No filters</i></p>
Filter by engine	<p>If enabled, filters CANbus data by engine state. It helps to solve errors in EcoDrive data calculations, which come from invalid CANbus data. Errors can</p>

	<p>occur, while the vehicle's ignition is turned off and shortly after it was turned on.</p> <p>More information: <a href="#">CANbus filter by engine state</a>.</p> <p>Default value: <i>Disabled</i></p>
Remember tachograph parameters when engine is OFF	<p>If enabled, the FM device keeps the last known driver-related IO parameter values when the engine is turned off and there is no communication with the digital tachograph. This might happen when the FMS gateway and digital tachograph switch to sleep mode.</p> <p>Default value: <i>Disabled</i></p>
Smart CAN IO selection	<p>Mostly used on the <i>OBD+LCV</i> and <i>LCV</i> modes. This functionality is used when it is needed to switch from one CAN interface to another without losing enabled CAN IO parameters.</p> <p>Default value: <i>Enabled</i></p>
DTC enable	<p>Only available on the <i>OBD</i> mode. If enabled, DTCs will be read via the OBD2 socket.</p> <p>Default value: <i>Disabled</i></p>
EasyCAN	<p>Only available in the <i>OBD+LCV</i> and <i>LCV</i> modes. If ticked, the end line terminator on the corresponding CAN line is enabled.</p> <p>More information: <a href="#">Advanced CAN Options</a> chapter.</p> <p>Default value: <i>Disabled</i></p>

Some use case examples of the **Smart CAN IO Selection**:

1. You have configured **CAN FMS 250 Active** on the 1<sup>st</sup> CAN port. You have enabled a few CAN IO parameters. Then, if you want to switch to the 2<sup>nd</sup> CAN port without losing enabled CAN IO parameters, click the **Disable** button in the **Smart CAN IO Selection** section. Disable the 1<sup>st</sup> CAN interface or set a different mode. Enable the 2<sup>nd</sup> CAN and set **FMS 250 Active**. The switch is completed.
2. The same method can be applied for the *LCV* mode. The same **Group** or **Subgroup LCV** combinations can be used on both interfaces and switched from one CAN interface to the other.
3. Switching *FMS* to *LCV* or from *LCV GroupX, SubgroupX* to *LCV GroupY, SubgroupY* is not recommended. Some CAN IO parameters may be lost.

## Possible Combinations of CAN Modes

Both CAN interfaces can be used at the same if supported by the device and CAN modes are compatible with each other. CAN modes compatibility is shown in the table below.



Only one CAN interface can be configured on Pro5 and FM-Pro4 devices.

CAN2 CAN	DX P CAN	LC V	MobilEye	OB D	HCV	Tach o read	Trailer s	FMS	J1939+DT C	OBD+LC V	Thermokin g SLX
<b>DXP CAN</b>	-	-	Yes	-	-	-	-	-	-	-	-
<b>LCV</b>	-	Yes	Yes (HCV/LC V)	Yes	-	Yes	Yes	-	-	-	-
<b>MobilEye</b>	Yes	Yes	-	Yes	Yes	Yes	Yes	Yes	-	Yes	-
<b>OBD</b>	-	Yes	Yes	-	-	Yes	Yes	Yes(HCV )	Yes	-	-
<b>HCV</b>	-	-	Yes	-	-	Yes	Yes	-	-	-	-
<b>Tacho read</b>	-	Yes	Yes	Yes	Yes	-	Yes	Yes	Yes	Yes	-
<b>Trailers</b>	-	Yes	Yes	Yes	Yes(HCV )	Yes	-	Yes	Yes	Yes	Yes
<b>FMS</b>	-	-	Yes	Yes	-	Yes	Yes	-	-	-	Yes
<b>J1939+DT C</b>	-	-	-	Yes	-	Yes	Yes	-	-	-	Yes
<b>OBD+LCV</b>	-	-	Yes (HCV/LC V)	-	-	Yes	Yes	-	-	-	-
<b>Thermokin g SLX</b>	-	-	-	-	-	-	Yes	Yes	Yes	-	-

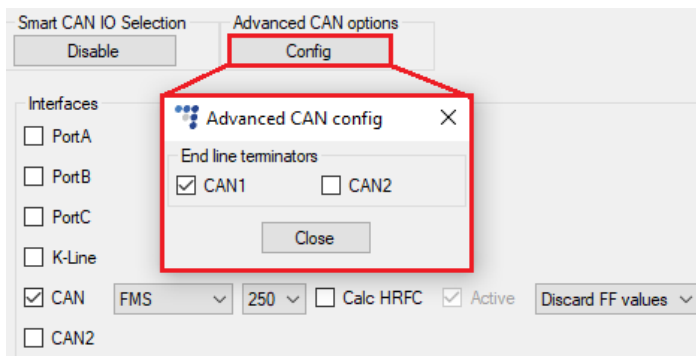
If the intersection area of two modes is marked (Yes and coloured), their combination can fully work when set on different CANs. Otherwise, if the intersection area is marked (-), only one of these modes can work at a time.

## Advanced CAN Options

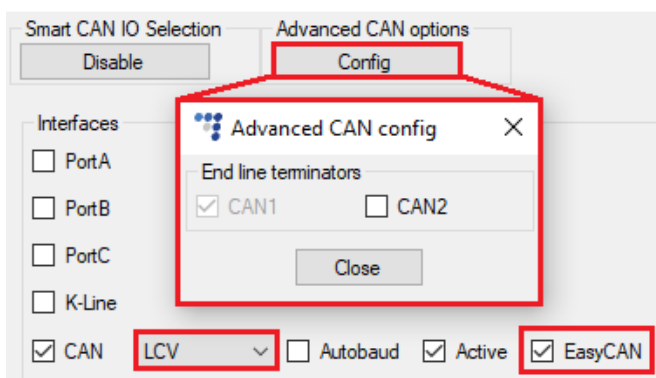
5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4

This functionality allows you to enable/disable the end line terminating resistor in the particular CAN interface.

After enabling **CAN** or/and **CAN2**, the terminating resistors in both CAN interfaces are turned on by default. Click the **Config** button in the **Advanced CAN options** section and tick the corresponding CAN checkbox to disable the resistor.

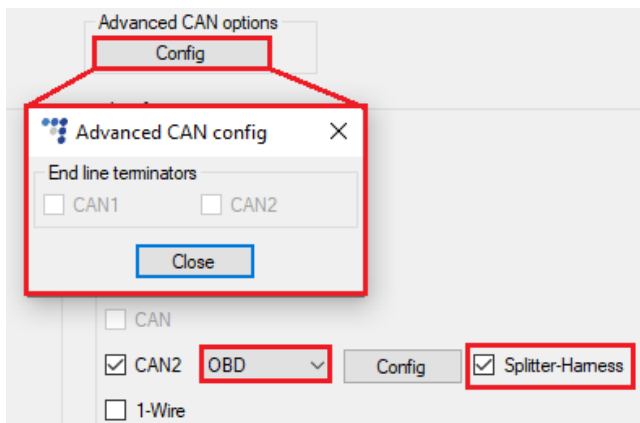


If you select the *LCV* CAN mode, then the **EasyCAN** checkbox will be enabled by default. This will automatically enable the end line terminating resistor in the CAN interface and grey it out.



If you are not using EasyCAN, but still need to turn on the terminating resistor, untick the **EasyCAN** checkbox, and enable the resistor.

If you select the *OBD* CAN mode, then there is an option to enable the **Splitter-Harness** checkbox. Ticking this checkbox will turn off the terminating resistors and the second CAN interface checkbox will be greyed out.



If the **Splitter-Harness** checkbox is not enabled, the terminating resistor will be turned on in the corresponding CAN interface.



If the second CAN interface is set as *Vendor OBD*, then both CAN interfaces terminating resistors are disabled and greyed-out.

## Manufacturer Specific OBD Data Reading

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✗	✓	✓	✗	✓	✗	✓	✗		✓		✗	✗	✗	✗

This functionality allows reading vehicle data that is not accessible using generic on-board diagnostics (generic OBD2 parameter IDs).

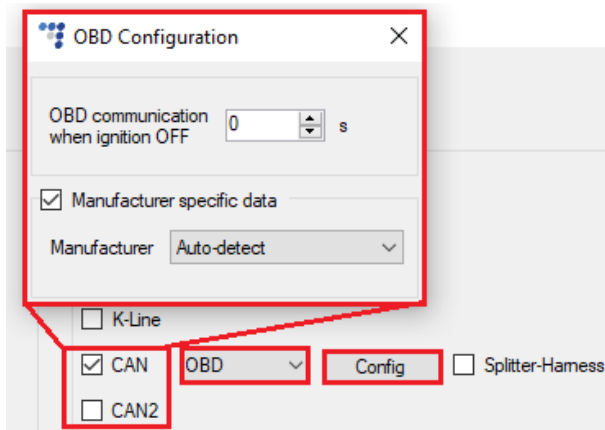
Configure manufacturer specific OBD data reading settings to read additional data via the OBD2 socket. Follow these steps to enable the functionality:

1. Enable **CAN** or **CAN2** port in the **Interfaces** section.
2. Select *OBD* from the drop-down list.
3. Click **Config**. A new **OBD Configuration** window will open.
4. Tick the **Manufacturer specific data** checkbox to enable the functionality.
5. Select the **Manufacturer** from the drop-down list. *Auto-detect* is the default option that automatically detects the manufacturer based on the vehicle's VIN.



The received data depends on the vehicle manufacturer, model, and in some cases even the engine. Consult our [OBD2 supported vehicles list](#) for more details.





The following manufacturers require a second CAN interface to be configured to read additional proprietary OBD data:

- Citroen
- Peugeot
- Fiat



Reading proprietary OBD data for Citroen and Peugeot vehicles requires a physical connection to a second CAN line.

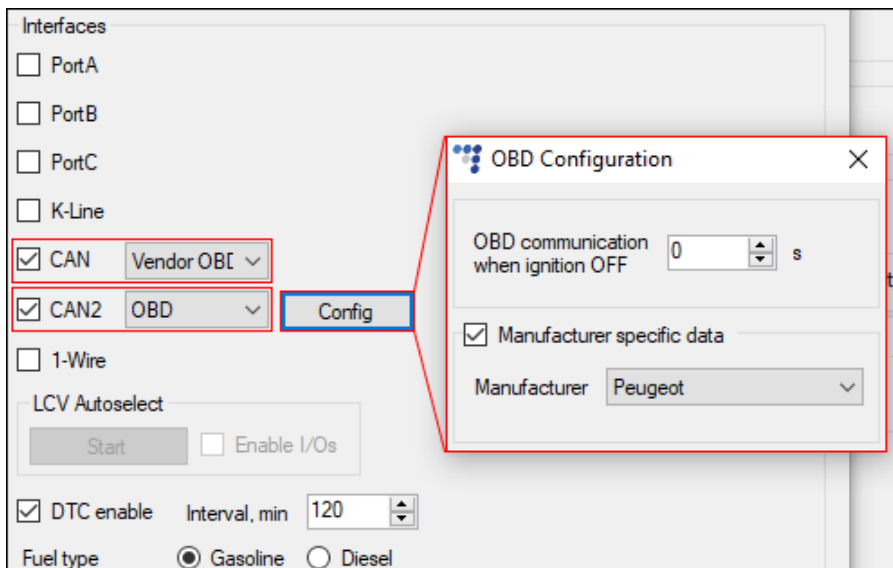
To configure the second CAN interface to read additional proprietary OBD data, tick the checkbox and select *Vendor OBD*.



If you check the **Splitter-Harness** checkbox, then the second CAN interface will only have the *Vendor OBD* option.



If you use the Ruptela OBD harness, **CAN2** must be configured as *OBD* and **CAN** must be configured as *Vendor OBD*. Otherwise, you will not get the correct data.



## Light Commercial Vehicle Configuration

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
						HCV5 Lite							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✗	✓	✓	✗	✓	✗	✓	✓	✓	✗	✗	✗	✗	✗

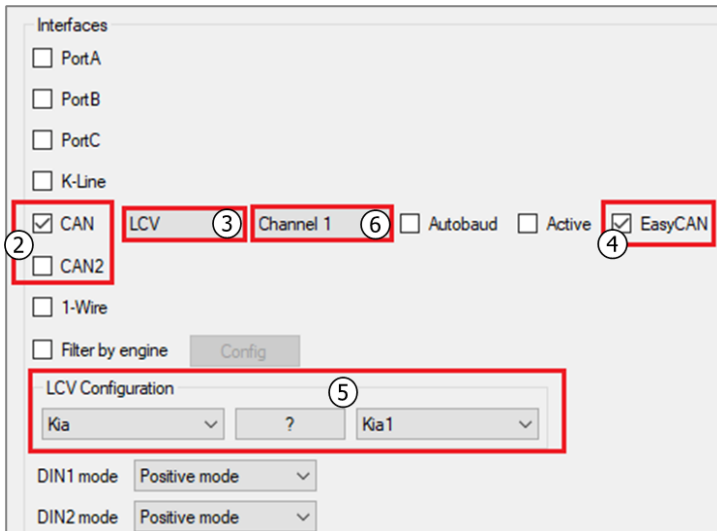


It is not recommended to use the *LCV* mode on FM-Tco4 HCV device. If you need to do so, the device must be configured using a USB cable.

The *OBD+LCV* and *LCV* modes allow reading specific CAN IO parameters that are supported on your vehicle. The combination of vehicle group and subgroup is used to determine the exact set of available CAN IO parameters for the selected vehicle. Follow these steps to configure LCV settings:

1. Enable the **Send I/O data with v1.1 protocol** checkbox (for 5th generation devices enabled in the background). The extended protocol may add some additional IO parameters for your vehicle.
2. Enable **CAN** or **CAN2** port in the **Interfaces** section.
3. Select *LCV* from the drop-down list.
4. If required, untick the **EasyCAN** checkbox (applicable only for 5th generation devices).
5. There are three methods to select the best possible combination of group and subgroup:

- Manual selection
  - Using the LCV selection wizard
  - Using the LCV autoselect functionality
6. In some cases, an additional **Channel** drop-down list may be displayed, meaning that parameters for this vehicle can be obtained only when two separate physical connections are used. Enable the other CAN interface and select *LCV* to enable the dual configuration.



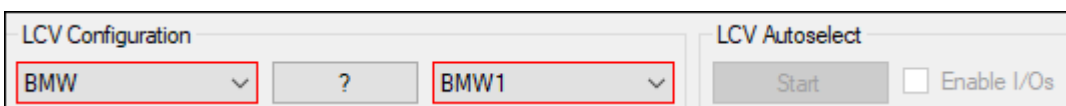

The received data depends on the vehicle manufacturer, model, and in some cases even the engine. Consult our [Supported vehicles list](#) for more details.



During the selection process, beware, that changing the combination of the LCV Group or Subgroup might automatically disable some of enabled IO parameters.

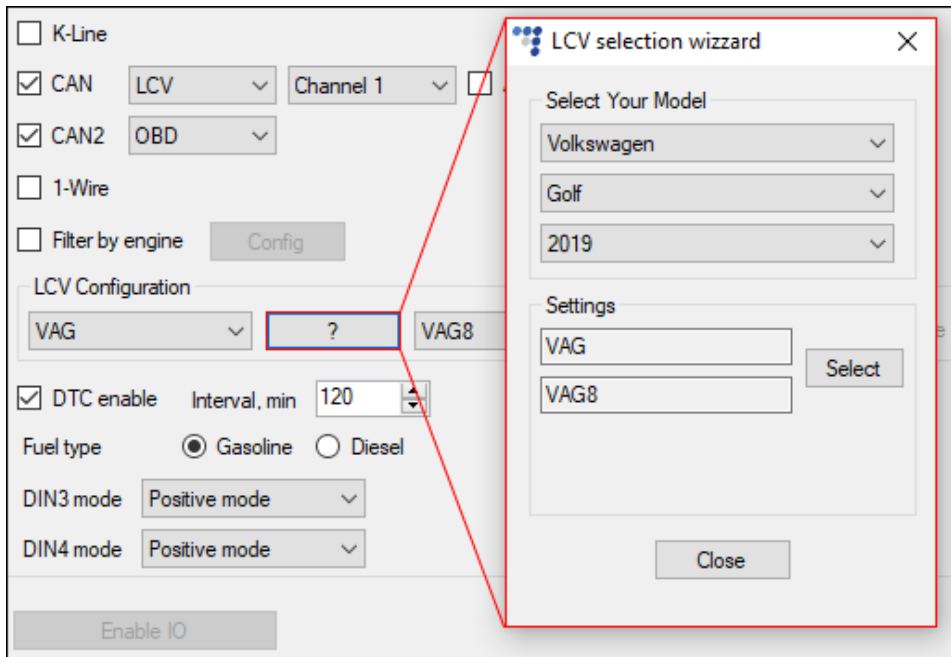
## Manual Selection

Use two drop-down lists in the **LCV Configuration** section and manually set the LCV group and subgroup combination. Use the [Supported vehicles list](#) to set the correct group and subgroup.



## LCV Selection Wizard

Click the question mark button in the **LCV Configuration** section. A new LCV selection wizard window will appear. Select the *Brand*, *Model*, and *Manufacture year* of your vehicle and click the **Select** button. The group and subgroup will be automatically selected.

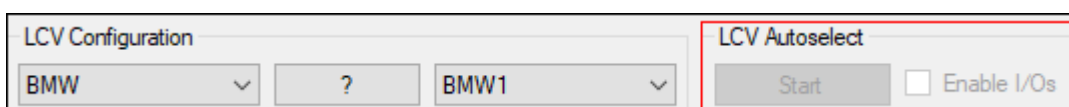


## LCV Autoselect

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
❌	✅	✅	❌	✅	❌	✅		❌	✅		❌	❌	❌	❌

The device can automatically select a correct LCV group and subgroup combination. The **LCV Autoselect** functionality allows to read and analyze CANbus line data to find the best matching configuration.

The following parameters are considered as high importance, which has greater significance during the auto-selection process: *Fuel*, *Vehicle distance*, *RPM*, *Wheel based speed*.



The **Enable I/Os** function will automatically enable all supported IO parameters for the vehicle. Several conditions must be met for the functionality to be activated:

- Tick the **Enable I/Os** checkbox before starting the auto-select functionality
- The **Send I/O data with v1.1 protocol** must be enabled
- Enough free IO slots must be available (the needed number varies, depending on the vehicle)

### Activation

The following criteria must be met:

1. The FM device is connected to the advanced configurator.
2. The engine is turned on.
3. The vehicle is not moving.
4. One or both CAN interfaces are connected to the vehicle's CANbus lines.
5. One of the following must be configured:
  - On both CAN interfaces *LCV* mode is selected (LCV group with dual channel)
  - On one CAN interface *LCV* mode is selected and the other CAN interface is disabled.
  - On one CAN interface *LCV* mode is selected and the other CAN interface is set to *Tacho read*, *MobilEye* or *Trailers*.
  - Both CAN interfaces are disabled.

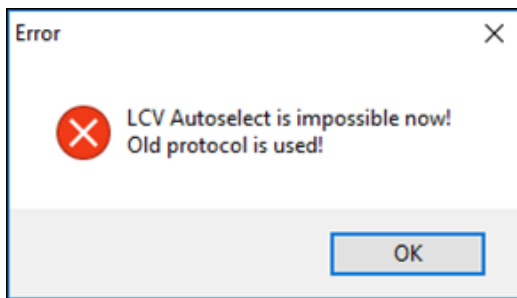
When the criteria are met, click the **Start** button in the **LCV autoselect** section to start the detection process. This might take up to a few minutes and meanwhile, the configurator is inactive. After a successful selection, the CAN interface(s) will be automatically configured with the selected LCV group and subgroup combination. To view the result, go to the main configurator window, click **Get CFG** and proceed to the **IO settings** window to view the current CAN interface configuration.



The functionality can also be enabled remotely using the *lcvselect* SMS Command. Parameters *distance* or *RPM* can be provided to make the auto-selection process more accurate. The SMS command description can be found in the SMS Command List.

Auto-selection failure is indicated with one of the following responses:

- *LCV Autoselect is impossible now! Old protocol is used!*
- *Not enough I/O slots*
- *LCV Autoselect is impossible now! Wrong CAN configuration*
- *There is no answer from the FM device – a critical process is running, please try again.*



The **LCV Autoselect** functionality works only with light vehicles. Also, the **Active** CAN mode is unavailable and as a result, *Toyota, Truck, Tractor, Claas* and *Komatsu* LCV groups are excluded from the selection process.



The **LCV Autoselect** functionality does not guarantee that all supported CAN IO parameters for the selected LCV group and subgroup will be available for a specific vehicle.

## 1-Wire Interface

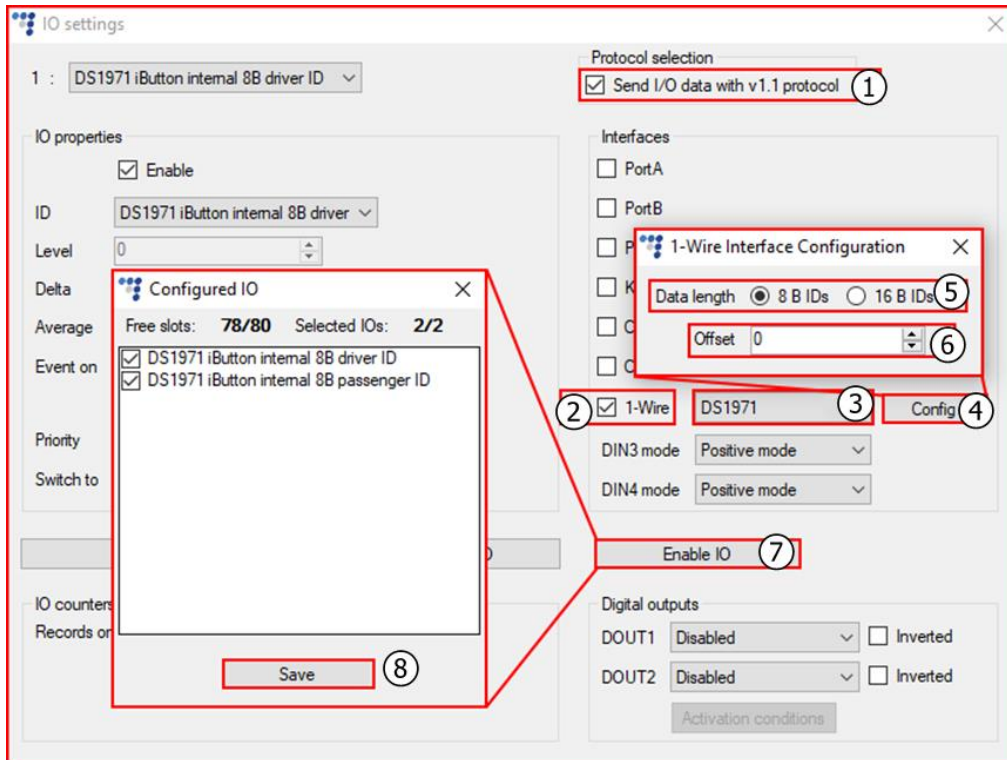
5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✗	✗	✓	✓		✓	✓	✓	✓	✓	✗

\* – not available for pre-revision Trace5 devices.

The 1-Wire interface is used to connect various peripherals and sensors. This specific selection is used to configure 1-Wire for use with DS1971. Follow these steps to configure the 1-Wire interface for use with DS1971.

1. Enable **Send I/O data with v1.1 protocol** in the **Protocol selection** section (for 5<sup>th</sup> gen devices enabled in the background).
2. Enable **1-Wire** in the **Interfaces** section.
3. Select *DS1971* from the drop-down list.
4. Click **Config**. A new **1-Wire Interface Configuration** window will open.
5. Set the **Data length** to determine how many bytes of data should be read. In an offset, the device will read bytes that are situated after skipped symbols. The default value is 8 bytes.
6. Set the **Offset** value. It defines how many starting symbols from the ID should be skipped when reading the DS1971 iButton. The default offset value is 0. Value range: 0 to 31.

7. Click **Enable IO**. A new **Configured IO** window will open.
8. Click **Save** to enable the selected IO parameters. All properties for the selected IO parameters will be automatically set.



## Digital Inputs

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✓	✗

Select which mode to use for digital inputs.

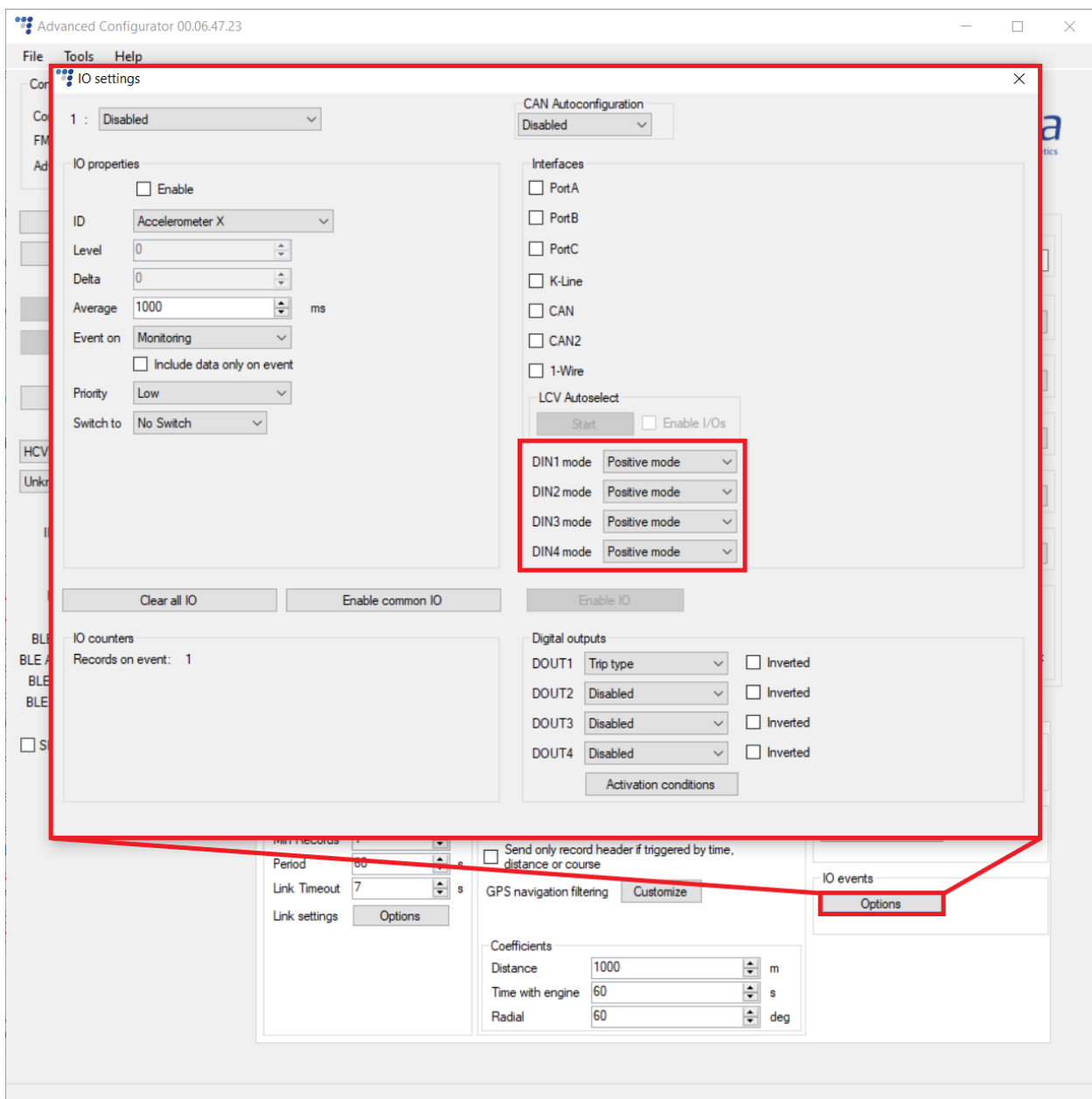
DINX mode	What signal level will change the state of the DIN. Possible values: <ul style="list-style-type: none"> <li><i>Positive mode</i> – the state is changed when voltage is detected</li> </ul>
-----------	---

- *Ground mode* – the state is changed when a ground connection is detected

Default value: *Positive mode*



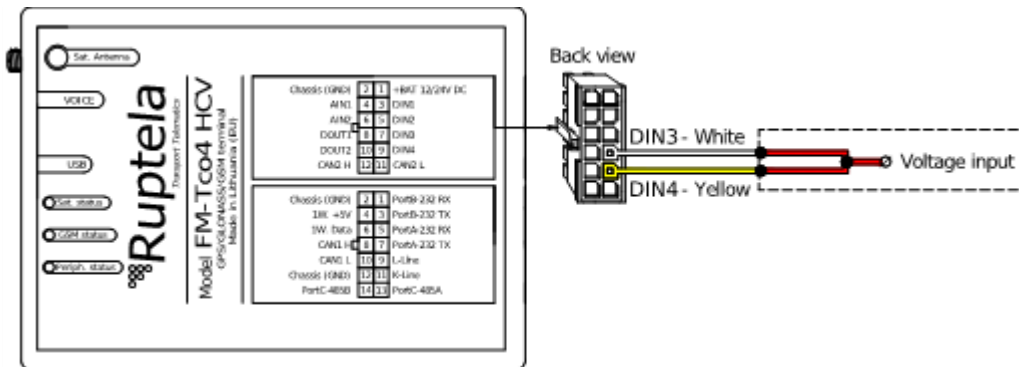
Some hardware versions of the devices may not support invertible digital inputs. Use the *setdinmode* SMS command to check, if your device supports the functionality.



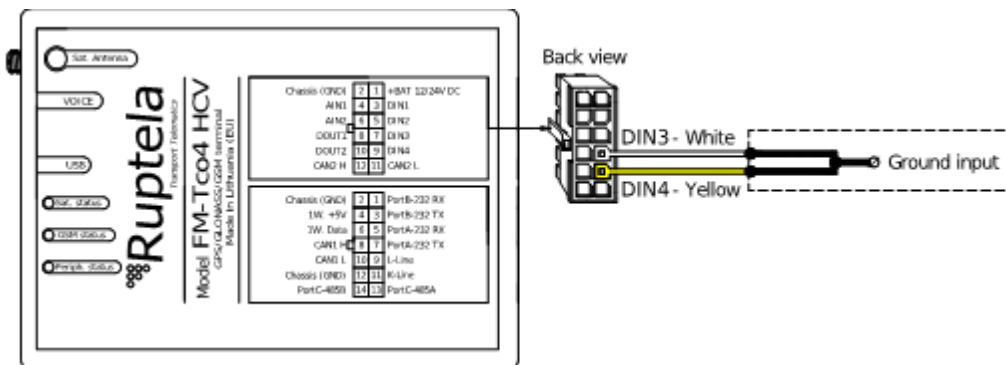
The number of available DINs is different depending on the device model.



Connection example in *Positive mode* :



Connection example in *Ground mode* :



## Digital Outputs

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV Tco4	LCV Pro4	Eco4	Eco S/T	Plug4	
✓*	✓	✓	✓	✗	✓	✓	✓	✓	✓	✓	✓	✗	

\* – partially available with the initial release for Trace5-2G, Trace5-LTE and Trace5-LTM (Rev.A).

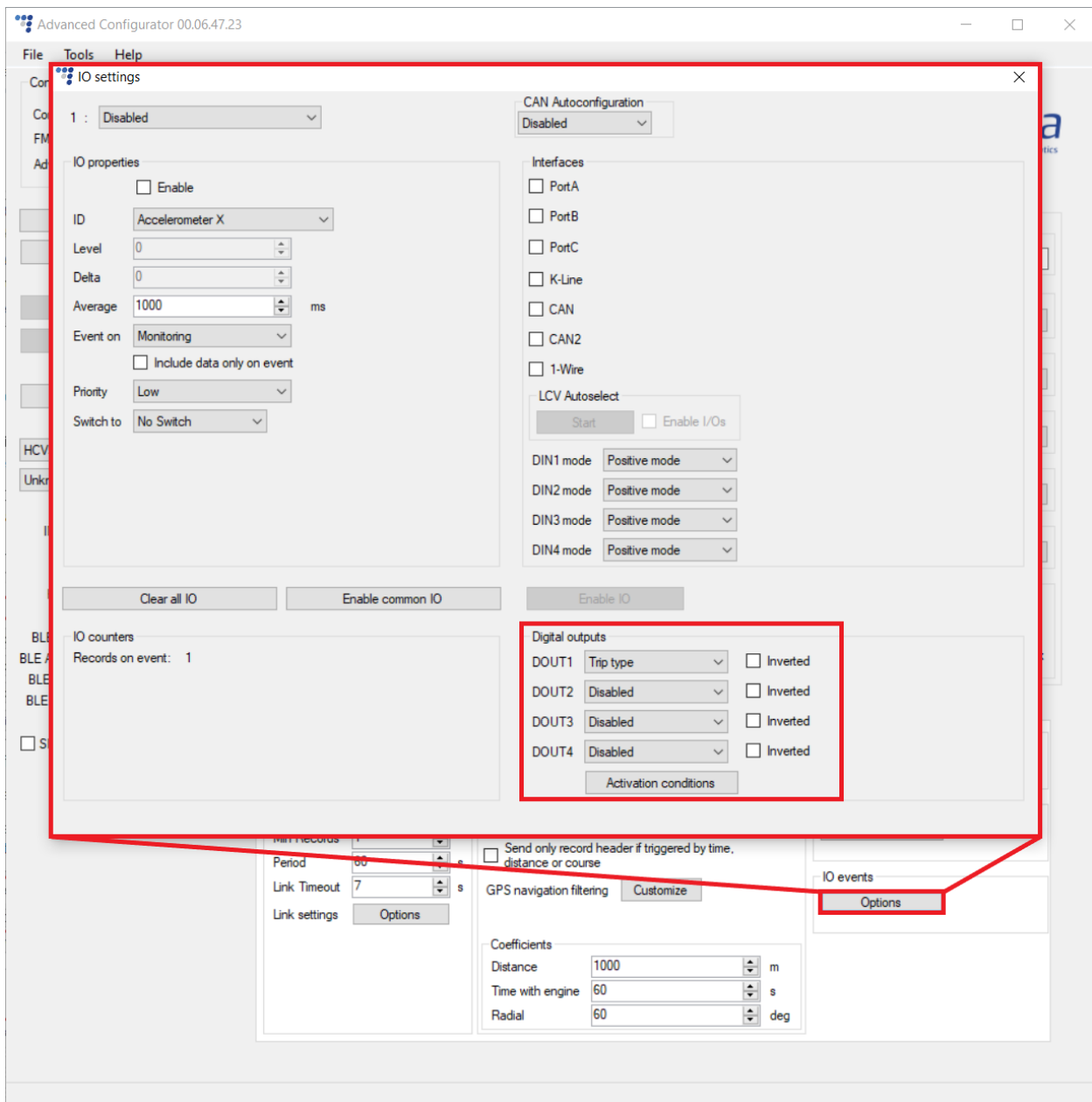


A full functionality description: [Digital Output User Manual](#).

DOUT modes compatibility with devices:

DOUT Modes	Trace5	HCV5	LCV5	Pro5	HCV5 Lite/Pro5 Lite	Tco4 HCV	Tco4 LCV	Pro4	Eco4	Eco S/T
<b>LED</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Buzzer</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Blocking</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>GSM jamming block</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Custom</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Immobilizer</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>Lock</b>	NA	-	Yes	-	Yes	-	Yes	-	-	-
<b>Unlock</b>	NA	-	Yes	-	Yes	-	Yes	-	-	-
<b>Lock/Unlock</b>	NA	-	Yes	-	Yes	-	Yes	-	-	-
<b>ATH</b>	NA	-	Yes	-	Yes	-	Yes	-	-	-
<b>Trip type</b>	-	Yes	Yes	Yes	-	Yes	Yes	Yes	-	Yes
<b>Anti-hijack</b>	-	Yes	Yes	Yes	-	-	-	-	-	-
<b>Security</b>	-	-	Yes	-	-	-	-	-	-	-
<b>Security - LED</b>	-	-	Yes	-	-	-	-	-	-	-
<b>Buzzer+</b>	-	-	-	-	-	-	-	Yes	-	-

NA - only Trace5 NA




Configure DOUT settings if you connected any peripherals to them.















DOUTX	<p>Which mode will be used for DOUTs. The mode selection depends on the connected peripherals. The same mode cannot be used on both DOUTs. Possible values:</p> <ul style="list-style-type: none"> <li>• <i>Disabled</i> – the DOUT is disabled but can be controlled remotely via SMS or GPRS commands</li> <li>• <i>LED</i> – the DOUT controls a connected LED indicator</li> <li>• <i>Buzzer</i> – the DOUT controls a connected sound indicator</li> </ul>
-------	---

	<ul style="list-style-type: none"> <li>• <i>Blocking</i> – used with <i>Blocking</i> driver registration mode, the DOUT blocks the engine from being started until a successful registration is made. The DOUT must be connected to a changeover relay.</li> <li>• <i>GSM jamming block</i> – the DOUT blocks the engine when GSM jamming is detected. The DOUT must be connected to a changeover relay.</li> <li>• <i>Custom</i> – used to emit a customizable pattern when the DOUT is triggered. <i>Custom</i> mode can be used with the Geofencing functionality or DOUT activation by conditions. <i>Custom</i> can only be enabled on one DOUT at a time.</li> <li>• <i>Immobilizer</i> – used to immobilize the vehicle. Can be activated and deactivated only via an SMS command.</li> <li>• <i>Lock</i> – used to lock the vehicle doors.</li> <li>• <i>Unlock</i> – used to unlock the vehicle doors.</li> <li>• <i>Lock/unlock</i> – used both to lock and unlock the vehicle doors.</li> <li>• <i>ATH</i> – if selected, the DOUT will block the engine if the <i>setlock</i> SMS command includes the <i>ath-on</i> parameter.</li> <li>• Trip type – used to differentiate between trip purposes (private or business) can be set by toggling a switch or pushing a button that is installed in the vehicle. When using the push button, you also have to predefine how the trip type changes when turning on the ignition.</li> <li>• Anti-hijack – is used to activate digital output in a pattern when network jamming is detected or when certain set parameter values are reached. It is also possible to initialize the mode using SMS or server (SMS via GPRS) commands.</li> <li>• Security – is used to activate and deactivate the <i>Security alarm</i> digital output (DOUT) under certain conditions. By default, the DOUT is deactivated and can only be activated by DIN, power supply, auto-geofence conditions, or an SMS/server command. Deactivation is possible by using the <i>iButton</i> or SMS/server command.</li> <li>• Security-LED – this mode shows the status of the current <i>Security</i> DOUT logic state via the configured LED DOUT.</li> </ul>
--	---

	<p>The LED will blink in short intervals every second when the <i>Security</i> DOUT state is 1 (armed) or 2 (ON).</p> <ul style="list-style-type: none"> <li>Buzzer+ – operates the same as the <i>Buzzer</i> mode, but behaves differently when providing indication for the speed based condition of the <a href="#">Geofencing</a> functionality. With <i>Buzzer+</i>, when the speed condition is met, the Buzzer+ DOUT will be activated and remain active until the Speed condition is no longer fulfilled.</li> </ul> <p>More information about these modes can be found in <a href="#">Digital Output manual</a>.</p> <p>Default value: <i>Disabled</i></p>
Inverted	<p>If turned on, the DOUT logic will be inverted (e.g., an active DOUT will output a high signal level instead of a low signal level).</p> <p>Default value: <i>Disabled</i></p>
Activation conditions	<p>Used to trigger the DOUT when the configured conditions are met.</p> <p>More information: <a href="#">DOUT configuration</a>.</p>

 The number of available DOUTs is different depending on the device model.

## Audio Settings

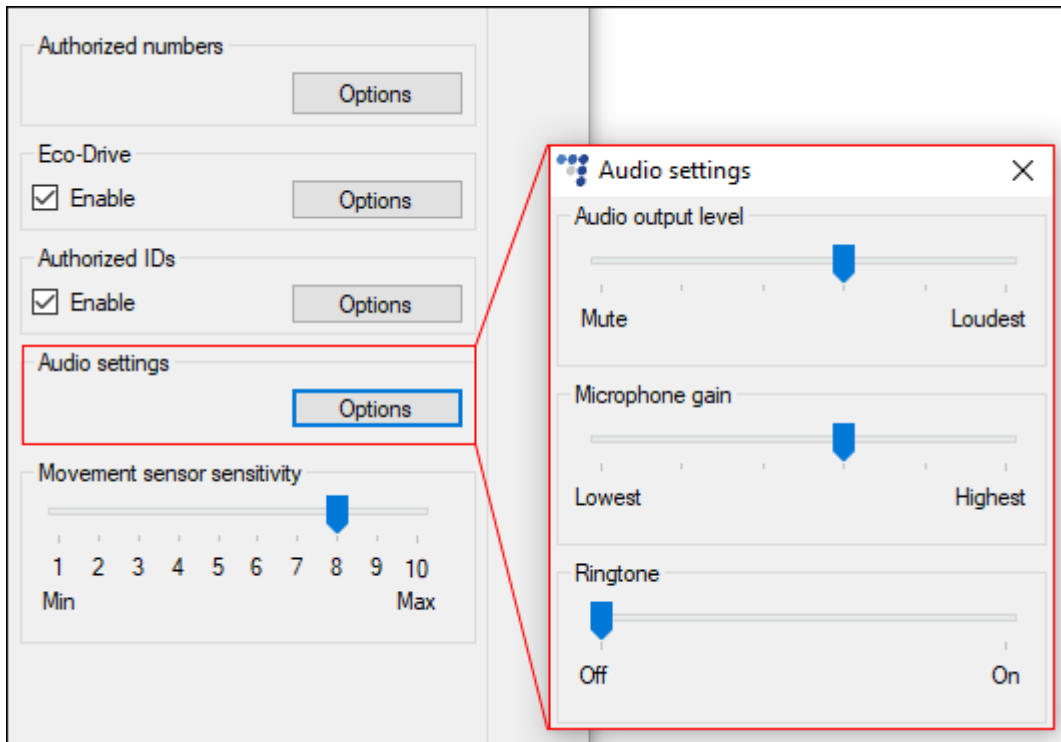
5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
														

\* - Only variants with 2G and 3G connectivity

Devices which have an audio jack interface have adjustable audio settings. Click the **Options** button in **Audio settings**. The following settings can be configured:

Audio output level	Sets the volume level of the audio output from <b>Mute</b> to the <b>Loudest</b> .
--------------------	--

	Default value: 4 of 6
Microphone gain	Sets the gain level of the microphone loudness from <b>Lowest</b> to <b>Highest</b> . Default value: 4 of 6
Ringtone	Enables or disables the ringtone. Default value: Off



## Wireless

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T	Plug4
✓*	✓	✓	✓	✓	✓	✓		✗		✗	✗	✗	✗	✗

\* – Trace5-LTE variants with BLE only.

Various wireless peripherals can be connected to tracking devices, which have BLE connectivity.

Click **Options** in the **Wireless** section to open the **Wireless Communication** window and manage your wireless peripherals.

There is 4 subsections here:

1. BLE API.
2. Beacon list.
3. Accessories List.
4. Enable IO.

Advanced Configurator 00.06.47.23

File Tools Help

Configuration file information

Configuration source: **Configurator** Target device: **Tco4 HCV**

FM device FW version: n/a CFG Tag:

Advanced Configurator version: **0.7.47.23** Last edited: **2019-09-19 06:36:30**

Connect

Send CFG

Get CFG

Send FW

HCV5

Unknown

IMEI: 0000000000000000

FW: XX.XX.XX.XX

BL: XX.XX

HW: X

BLE St: X

BLE APP:

BLE BL:

BLE SD:

☐ SIM status: -----

Global

Protocol ☒ UDP ☐ TCP

Connection settings

IP1

Port1  ☐ SSL 1

IP2

Configuration Password

Authorized numbers

Eco-Drive

Authorized IDs ☒ Enable

Wireless ☒ Enable

Audio settings

Movement sensor sensitivity  1 2 3 4 5 6 7 8 9 10 Min Max

Driver registration

GNSS

Wireless Communication

Device Name

Connection PIN

Admin Password

Beacon list

Accessories List

Enable IO

Close

Profile 1 Profile 2 Profile 3 Profile 4

Sleep  after  s

Data sending ☒ Enable

Min Records

Period  s

Link Timeout  s

Link settings

Data collection ☒ Enable

SD card logging interval  s

Time without engine  s

Engine

☐ Send only record header if triggered by time, distance or course

GPS navigation filtering

Coefficients

Distance  m

Time with engine  s

Radial  deg

Network

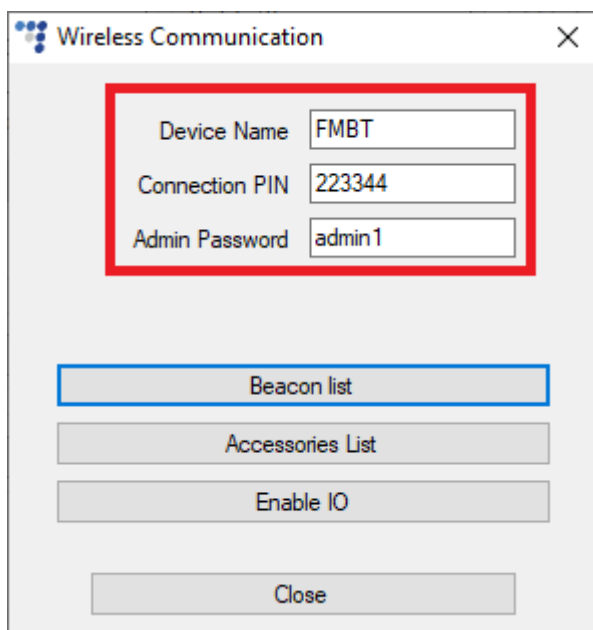
Operator list

IO events

## BLE API

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
❌	✅	✅	✅	✅	❌	❌	❌	❌	❌	❌	❌	❌	❌

BLE API can be used to obtain data from device or control digital outputs through another BLE enabled device (tablet, smartphone, laptop), via GATT server.



Device Name	8 symbol name, Default - FMBT In case if FMBT is used, BT part will be replaced by last 6 digits of device IMEI. Example: if device's IMEI is 863514050 024971 then Device Name will be FM024971
Connection PIN	PIN that will be used to pair the device and access it's GATT server.
Admin Password	Developer password, used for debugging purposes

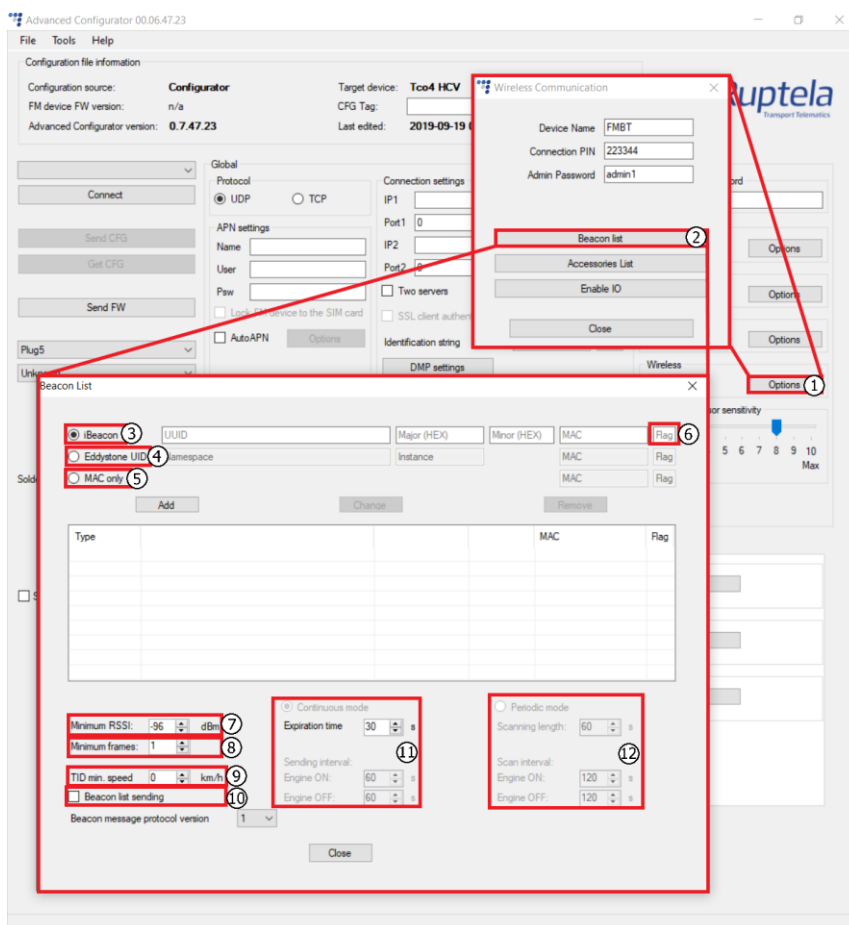


**Device name, Connection PIN and Admin Password configuration parameters do not need to be changed.**

## Beacon List

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
						HCV5 Lite							
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✗	✗	✗	✗	✗	✗	✗

The beacon list functionality allows you to identify and monitor BLE beacons (BLE radio transmitters), that surround the tracking device. The device scans beacons for a specific interval duration and acknowledges only those, that are entered into the beacon list.



The following BLE beacon profiles and parameters can be entered in the beacon list configuration:

iBeacon	Monitor beacons, which are using the iBeacon protocol. More information: <a href="#">iBeacon</a>
Eddystone ID	Monitor beacons, which are using the Eddystone EID protocol More information: <a href="#">Eddystone ID</a>
MAC only	Monitor any beacon only by its MAC address.
Flag	Mark beacons with ASCII symbols. E.g, enter the letter <i>T</i> if the beacon will be used for the Wireless trailer ID.
Minimum RSSI	Filter out beacons by the (Received Signal Strength Indication). You can set the minimum beacon signal strength in dBm, and if the beacon has the signal equal, or stronger than the entered value, then this beacon will be monitored.  Possible values: -96 to 0.  Default: <i>-96</i> .
Minimum frames	Filter out beacons that are only detected for a very short time. Enter how many frames should be received from a beacon to add it to the sending list.  Possible values: 1 to 30.  Default: <i>1</i> .
TID min. speed	Minimum speed in km/h that is needed for the Wireless Trailer ID assignation.  Possible values: 0 to 100.  Default: <i>0</i> .
Beacon list sending	Tick this checkbox if you want to send the whole scanned beacon list to the server. If the checkbox is not ticked, only Wireless trailer ID functionality will be available.  <b>Note:</b> The checkbox should not be ticked if the server does not support the GPRS command 38/138.
Continuous mode	The tracking device scans for beacons continuously.  <ul style="list-style-type: none"> <li>• <b>Expiration time</b> – Enter the duration in seconds, for which the beacon should remain in the list after the last frame is received.</li> </ul> Possible values: 30 to 3600.  Default: <i>30</i> .

	<ul style="list-style-type: none"> <li>• <b>Sending interval</b> – Enter the beacon record sending interval in seconds when the ignition is ON or OFF. When interval elapses, the device will check if any unsent beacon messages are in the memory and will try to send them to the server.</li> </ul> <p>Possible values: 30 to 65535.</p> <p>Default: <i>60</i>.</p>
Periodic mode	<p>The tracking device scans beacons periodically, for a certain duration.</p> <ul style="list-style-type: none"> <li>• <b>Scanning length</b> – Scan duration in seconds.</li> </ul> <p>Possible values: 20 to 3600.</p> <p>Default: <i>120</i>.</p> <p><b>Scan interval</b> – Period duration in seconds between the start of current and next scan, when the ignition is ON or OFF.</p> <p>Possible values: 30 to 65535.</p> <p>Default: <i>120</i>.</p>



Overall you can enter up to 20 sets of profiles with their parameters.



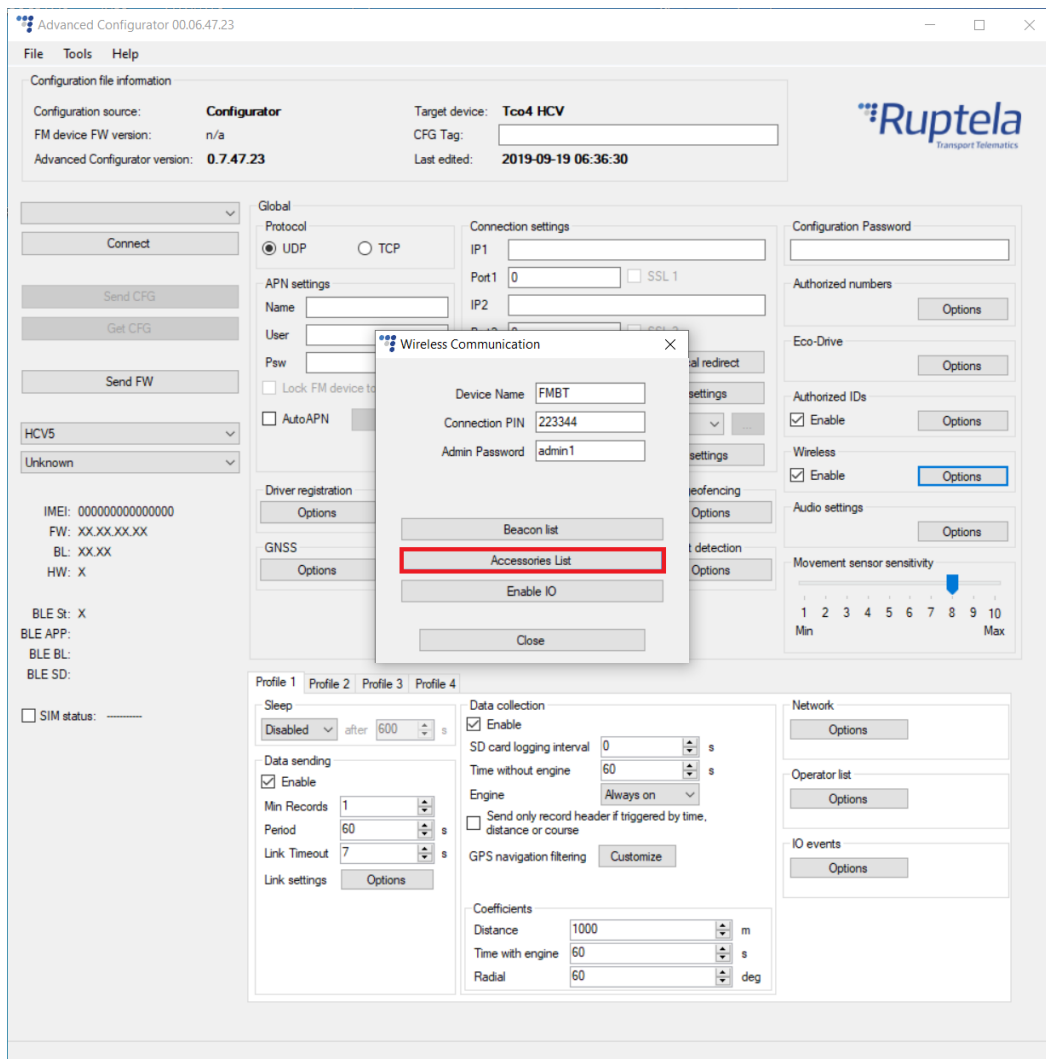
Up to 50 different beacons can be monitored at any given moment.



More in detail information about Beacon configuration can be found [here](#).

## Accessories List

Click **Accessories List** to open the BLE Accessories window.



In the appeared list you can enter up to five BLE accessories. For this you have to enter the following parameters:

Slot	Select a free slot for the accessory. The IOs must be assigned to the respective slot numbers, e.g. if a temperature sensor is configured on the slot 0, the <i>BT temperature sensor 0</i> parameter must be selected.
ID/MAC	Enter the sensor identifier. You can find the IDs in the following locations: <ul style="list-style-type: none"> <li>For the Tzone TZ-BT04 temperature and humidity sensors – on the back of the sensor (in HEX format).</li> </ul>

	<ul style="list-style-type: none"> <li>• For the ELA sensors – on the sticker of the sensor (in ASCII format).</li> <li>• For the Technoton S7 DUT-E sensors – below the head of the probe (in HEX format).</li> <li>• For the Technoton S7 GNOM sensors – on the head of the probe (in HEX format).</li> <li>• For the Escort TD sensors – under the sensor cap (enter without colons and in lowercase).</li> </ul>
Timeout	How much time can pass between two consecutive advertisement packets, received from a particular sensor. If the timeout is exceeded, the IO parameter will contain an error value.
Type of BLE accessory	Select the type of accessory, which you are connecting to.



You should select the slot and type of accessory first before entering the ELA sensor ID. Otherwise you will not be able to enter the ID in ASCII format.

Click the **Add** button to enter the values into the table. To remove an accessory from the list, click **Remove**. If you need to change one of the entered accessories, click on the required row and then **Change**.

BLE Accessories

Slot

Device ID / MAC address

Timeout

Type of BLE accessory

▼

30

Technoton GNOM DP S7

Add

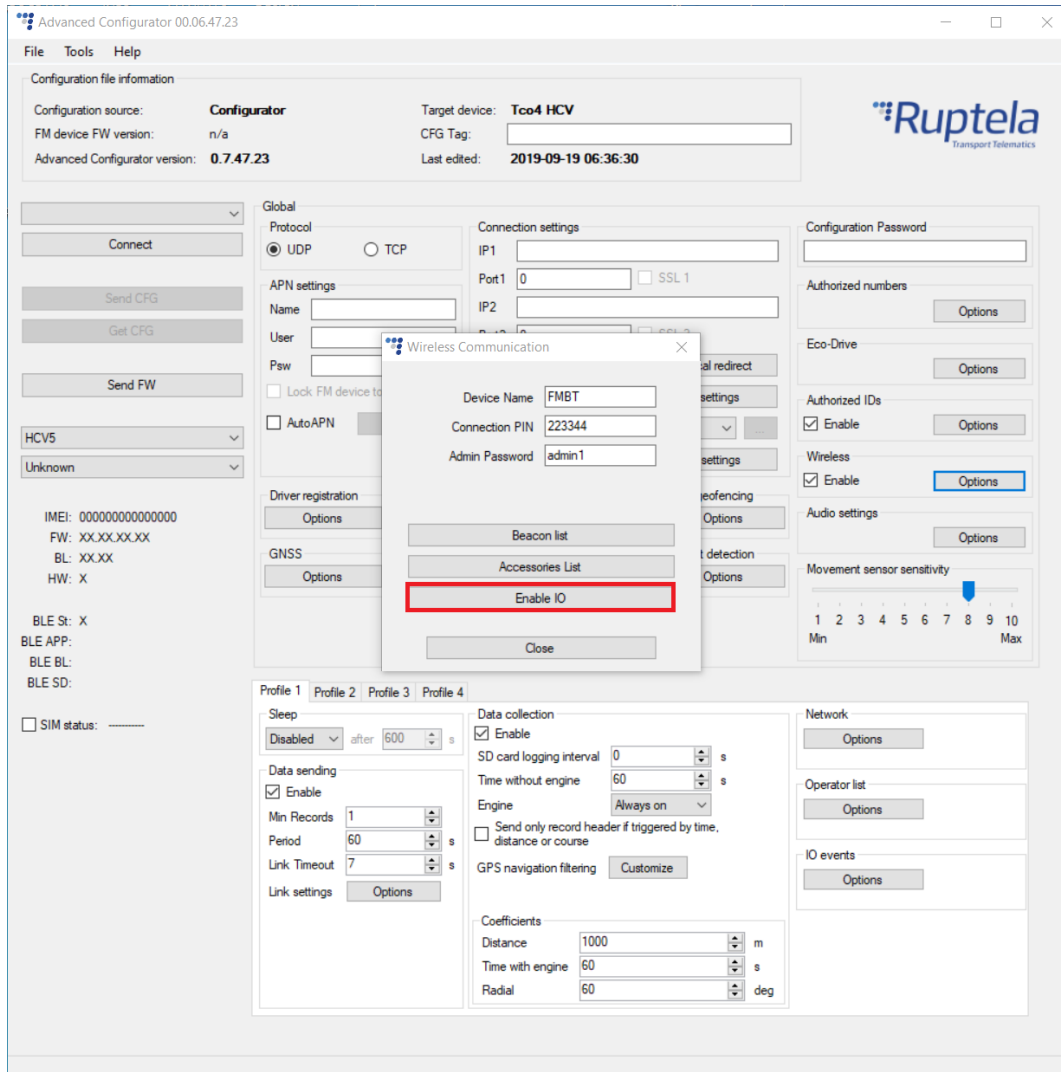
Change

Remove

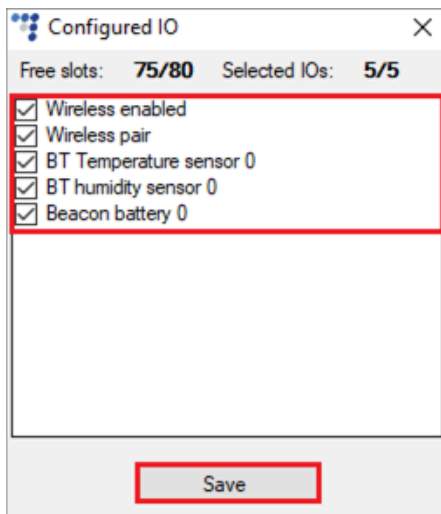
Slot	ID / MAC	Timeout	Type of accessory
0	0018e9d586d6	30	Technoton DUT-E S7
1	01014735c058	30	Technoton GNOM DDE S7
2	010182fe50ec	30	Technoton GNOM DP S7
3	e43c814f16d1	30	Escort TL BLE
4	P T 80331B	30	ELA DI

Close

## Enable IO



To reduce the IO selection time, you can click **Enable IO** in the **Wireless Communication** window. This feature will offer you only those IO parameters, which are applicable for the sensors assigned to the slots. E.g., if there is one sensor, which is assigned to the slot 0, in the window you will see *BT Temperature sensor 0*, *BT humidity sensor 0*, *Beacon battery 0* parameters. If required, uncheck some checkboxes and click **Save** to enable these parameters.



Configured IO

Free slots: **75/80** Selected IOs: **5/5**

- ☒ Wireless enabled
- ☒ Wireless pair
- ☒ BT Temperature sensor 0
- ☒ BT humidity sensor 0
- ☒ Beacon battery 0


Save

For ELA sensors, the *Beacon battery X* parameter values will be displayed only when the battery charge level is below 15%. If the battery charge level is higher, the parameter value will be 255.



The Technoton S7 (DUT-E, GNOM) sensors indicate low battery level (<10%) with a 1024 value in DTC. This data can be read via IO parameter *Beacon x DTC*, where *x* is the slot number.

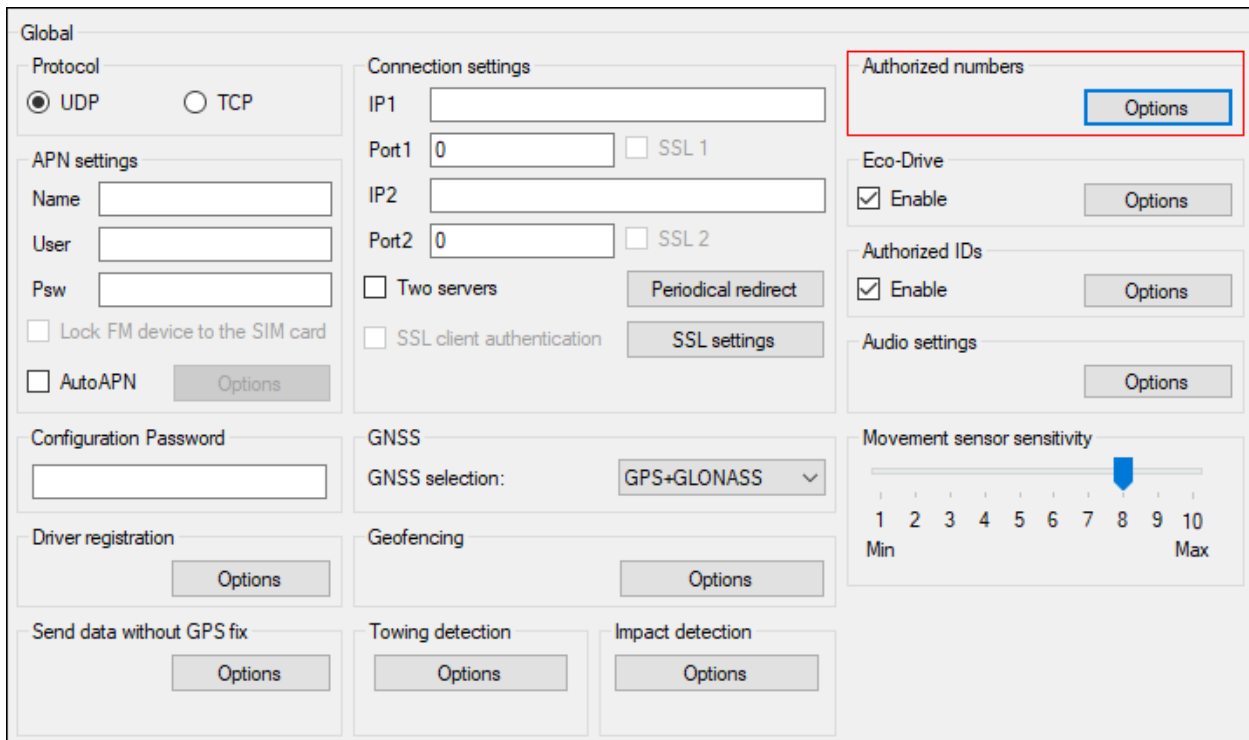
## 1.11 SMS Commands and Settings

 A full description of the SMS commands: [SMS Commands List](#).

This part of the configuration describes SMS commands. This is an easy and quick way to interact with the FM device remotely. After sending an SMS command to the FM device, it can respond with an SMS message informing about the result.

The following configuration parts are described:

1. SMS authentication settings
2. SMS alerts
3. General description of how to configure the FM device using SMS commands



The screenshot displays the Ruptela configuration interface with the following sections:

- Global**
  - Protocol: ☒ UDP, ☐ TCP
  - APN settings: Name, User, Psw, Lock FM device to the SIM card, AutoAPN (Options)
  - Configuration Password
  - Driver registration (Options)
  - Send data without GPS fix (Options)
- Connection settings**
  - IP1, Port1, IP2, Port2, SSL 1, SSL 2
  - Two servers, Periodical redirect, SSL client authentication, SSL settings
- Authorized numbers** (highlighted with a red box)
  - Options
- Eco-Drive**
  - ☒ Enable (Options)
- Authorized IDs**
  - ☒ Enable (Options)
- Audio settings**
  - Options
- GNSS**
  - GNSS selection: GPS+GLONASS
- Geofencing**
  - Options
- Towing detection**
  - Options
- Impact detection**
  - Options
- Movement sensor sensitivity**
  - Slider from 1 (Min) to 10 (Max), currently set at 8



## Authorized Numbers


5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓

The authorized numbers settings cover all SMS configuration settings including security, number validation, SMS commands, and others.

In the main window, click the **Options** button in the **Authorized numbers** section to configure the following settings:

Password	<p>Set a password to restrict access to the SMS commands feature.</p> <p>If entered, you will need to include the SMS password before every SMS command. This password cannot contain any names of any SMS commands and can contain up to 16 symbols. The following symbols are allowed:</p> <ul style="list-style-type: none"> <li>• All digits (0-9)</li> <li>• Letters A-Z (lowercase and uppercase)</li> <li>• _ @ # / % -</li> </ul> <p>Default value: <i>None</i></p>
SMS Alert Number	<p>When a specific IO parameter is triggered, the FM device will send an alert message to this number.</p> <p>Default value: <i>None</i></p>
Call Number	<p>When a specific IO parameter is triggered, the FM device will call this number.</p> <p>Default value: <i>None</i></p> <p>Call duration: 300 s</p> <p>Not available for: Trace5, FM-Eco4, FM-Eco4 S/T, FM-Plug4</p>
Valid Numbers	<p>Enter a list of numbers that will be able to send commands to the device.</p> <p>Default value: <i>None</i></p>

Enable list for voice calls	<p>If enabled, the entered numbers in the list can make a phone call to the device.</p> <p>Default value: <i>Disabled</i></p> <p>Not available for: Trace5, FM-Eco4, FM-Eco4 S/T</p>
Enable configuration over SMS	<p>If enabled, enables device configuration using SMS commands.</p> <p>Default value: <i>Enabled</i></p>
Reject all incoming calls	<p>If enabled, the device will reject all incoming calls.</p> <p>Default value: <i>Disabled</i></p> <p>Not available for: Trace5, FM-Eco4, FM-Eco4 S/T</p>
Use ID in SMS commands	<p>If enabled, an ID tag must be provided to every sent SMS command. The device will respond with the same ID, showing to which command the device has replied. If the ID is not provided, SMS commands will not be processed.</p> <p>Default value: <i>Disabled</i>.</p> <p>Not available for: FM-Eco4, FM-Plug4</p>


Numbers

Password

SMS Alert Number
00 -

Call Number
00 - 
☐ Short code

Call duration, s
300

Valid Numbers
1 00 - 
10 00 -

☐ Enable list for voice calls
☒ Enable configuration over SMS
☐ Reject all incoming calls
☐ Use ID in SMS commands

Close

## SMS Alerts

5 <sup>th</sup> Generation Devices							4 <sup>th</sup> Generation Devices						
Trace5	HCV5	LCV5	Pro5	Plug5	Eco5	HCV5 Lite Pro5 Lite	Tco4	HCV	Tco4	LCV	Pro4	Eco4	Eco S/T Plug4
✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Some of the enabled IO parameters have an option to enable the SMS alert feature. The SMS alerts will be sent to the **SMS Alert Number** provided in the **Authorized numbers** options. The SMS alert message can be customized.

The following configured IO parameters can trigger the SMS alert functionality:

- All DINs – if **Event on** is set to *Change*
- Power supply voltage – if **Event on** is set to *Hysteresis (On Both or On Falling)*
- GPS speed – if **Event on** is set to *Hysteresis (On Both or On Rising)*
- Autogeofence alert – if **Event on** is set to *Change*

IO properties

☒ Enable
☐ Make a Call

ID
DIN1

Level
0

Delta
0

Debounce
1000
ms

Event on
Change

☒ Include data only on event

Priority
Low

Switch to
No Switch

☒ SMS Alert

SMS alert text

Event on high

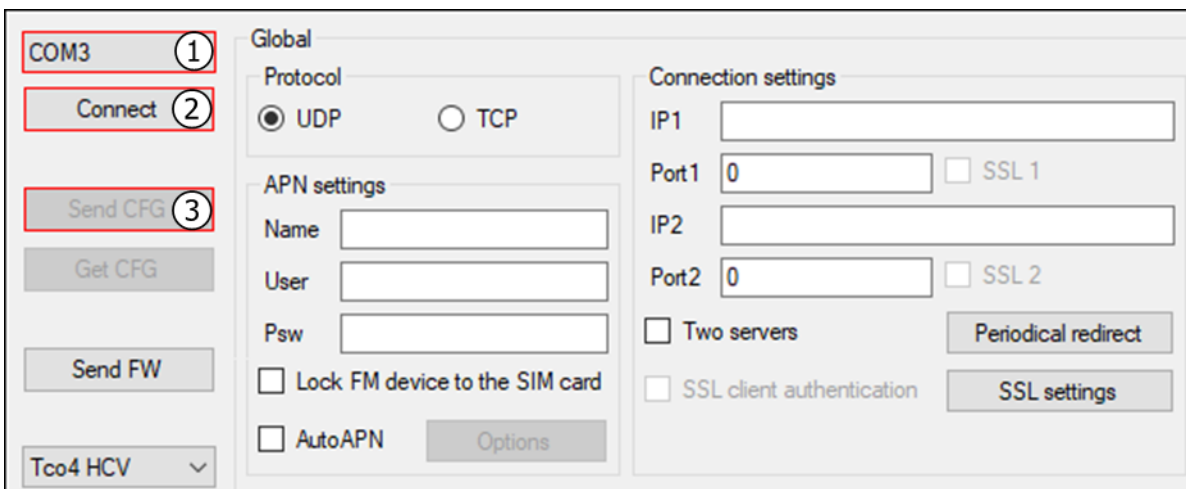
Event on low

## 1.12 Finishing the Configuration

Once you have configured the device, do not forget to save the configuration to a file (using the **Save CFG** button in the menu toolbar) or the device.

Follow these steps to send the configuration to the device:

1. Select the **COM port** through which the FM device is connected to the computer.
2. Click the **Connect** button.
3. Click the **Send CFG** button to upload the configuration to your device.



The screenshot shows the Ruptela configuration window. On the left sidebar, the 'COM3' dropdown menu is highlighted with a red box and a circled '1'. Below it, the 'Connect' button is highlighted with a red box and a circled '2'. Further down, the 'Send CFG' button is highlighted with a red box and a circled '3'. The main area is divided into three sections: 'Global' (containing 'Protocol' with 'UDP' selected and 'TCP' as an option), 'APN settings' (containing fields for 'Name', 'User', and 'Psw', and checkboxes for 'Lock FM device to the SIM card' and 'AutoAPN'), and 'Connection settings' (containing fields for 'IP1', 'Port1', 'IP2', and 'Port2', checkboxes for 'SSL 1', 'SSL 2', and 'Two servers', and buttons for 'Periodical redirect' and 'SSL settings'). At the bottom left, there is a dropdown menu labeled 'Tco4 HCV'.

## 1.13 Updating the Firmware

We highly recommend using the newest firmware to take advantage of our newest functionalities and improvements. Device firmware can be updated automatically when the Device Center is newer than the firmware.



The device will not send any data during firmware updates.



If the advanced configurator is older than the firmware, you will not be able to load and save configuration files from/to the device. You will need to update the configurator.

### Firmware File Extensions

HCV5: **.efwt5**

LCV5: **.efwl5**

Pro5: **.efwp5**

HCV5 Lite/Pro5 Lite: **.efwg5**

Trace5-LTM (pre-revision): **.efwa5**

Trace5 NA: **.efwb5**

Trace5 (all other versions): **.efwd5**

Plug5: **.efwe5**

Eco5: **.efwy5**

FM-Tco4 HCV: **.efwt4**

FM-Tco4 LCV: **.efwl4**

FM-Pro4: **.efwp4**

FM-Eco4: **.efwe4**

FM-Eco4 S: **.efwk4**

FM-Eco4 T: **.efwk4**

FM-Eco4 RS T: **.efwj4**

FM-Plug4: **.efwo4**

General firmware file pack for all the tracking devices: **ReleasePack\_XXXX-XX-XX.fwp**. Where **XXXX-XX-XX** is the release of the firmware update.

## Updating Firmware Automatically

If the advanced configurator is newer than the detected device firmware, it will suggest updating the firmware. Click **Yes** to update the firmware. Click **No** to create a configuration without updating the firmware. If the firmware is not updated, you will not be able to load and save configuration files from/to the device.



This method does not require an internet connection. This allows you to update the firmware at any time or location if you have the newest advanced configurator.



If you skipped the automatic firmware update suggestion and you do not want to update the firmware manually, click **Send FW** and then **Cancel**. The advanced configurator will suggest again to update the firmware.

## Updating Firmware Manually

### Updating Firmware using .efw\* Extension Files

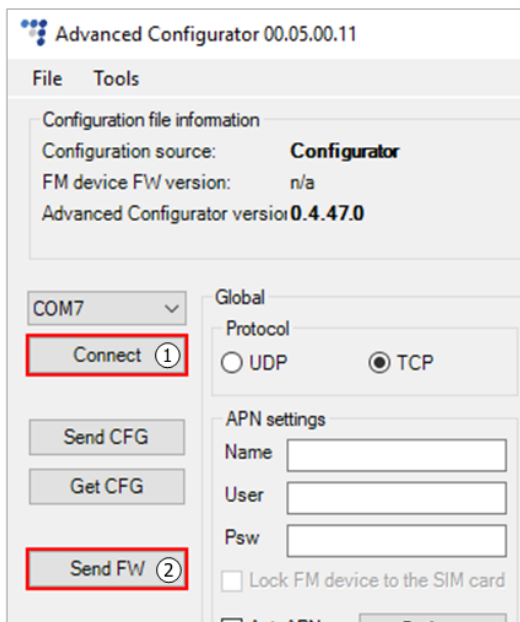
To update the firmware with the .efw\* extension file, click **Connect** and **Send FW** in the main configurator menu. Locate your firmware file and click **Open**. The firmware update process will start.



The BLE module may not work if the tracking device will be updated only with the .efw\* firmware extension file. To enable BLE, refer to chapter 14.3.2.



The CAN2 interface may not work if the tracking device will be updated only with the .efw\* firmware extension file.



## Updating Firmware using .fwp Pack

If you do not want to manually search for an appropriate firmware file for your tracking device, you can use a general firmware pack for all devices and the advanced configurator will select the file for you. To update the firmware with the .fwp pack, click **Connect** and **Send FW** in the main configurator menu. Locate your firmware .fwp pack and click **Open**. The advanced configurator will upload the required device firmware file(s) and the update process will start.



To update the BLE module or CAN extender firmware, the tracking device must be first connected to a power supply.



If the BLE module firmware version is incompatible with the device firmware version, BLE will be disabled.



If the CAN extender firmware version is incompatible with the device firmware version, the CAN2 interface will be disabled.



## Headquarters

Perkūnkiemio str. 6. LT-12130 Vilnius,  
Lithuania

[info@ruptela.com](mailto:info@ruptela.com)

+370 52 045 188


## Website

[www.ruptela.com](http://www.ruptela.com)

## Documentation portal

<https://doc.ruptela.com>

## Technical Support

 English

+370 5 286 2527

 Espanol

+370 5 246 1550

 Polski

+48 22 209 25 32

 Lietuvių

+370 5 204 5030

[support@ruptela.com](mailto:support@ruptela.com)