

# GNSS Performance Improvements

## 1 Introduction

### 1.1 About the Functionality

Numerous GNSS improvements were developed in 2019. This document explains, how to utilize these improvements for FM-Eco4 S devices that had position accuracy issues.

### 1.2 Legal Information

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### 1.3 Contact Information

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## 1.4 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 highlight important information or special conditions.

### **Tip**



Suggestions on how to proceed.


## 1.5 References


User manual: <https://doc.ruptela.lt/pages/viewpage.action?pageId=2129929>

Advanced configurator user manual: <https://doc.ruptela.lt/pages/viewpage.action?pageId=2129929>

Configurable navigation filtering: <https://doc.ruptela.lt/pages/viewpage.action?pageId=2129929>

## 2 Configuration

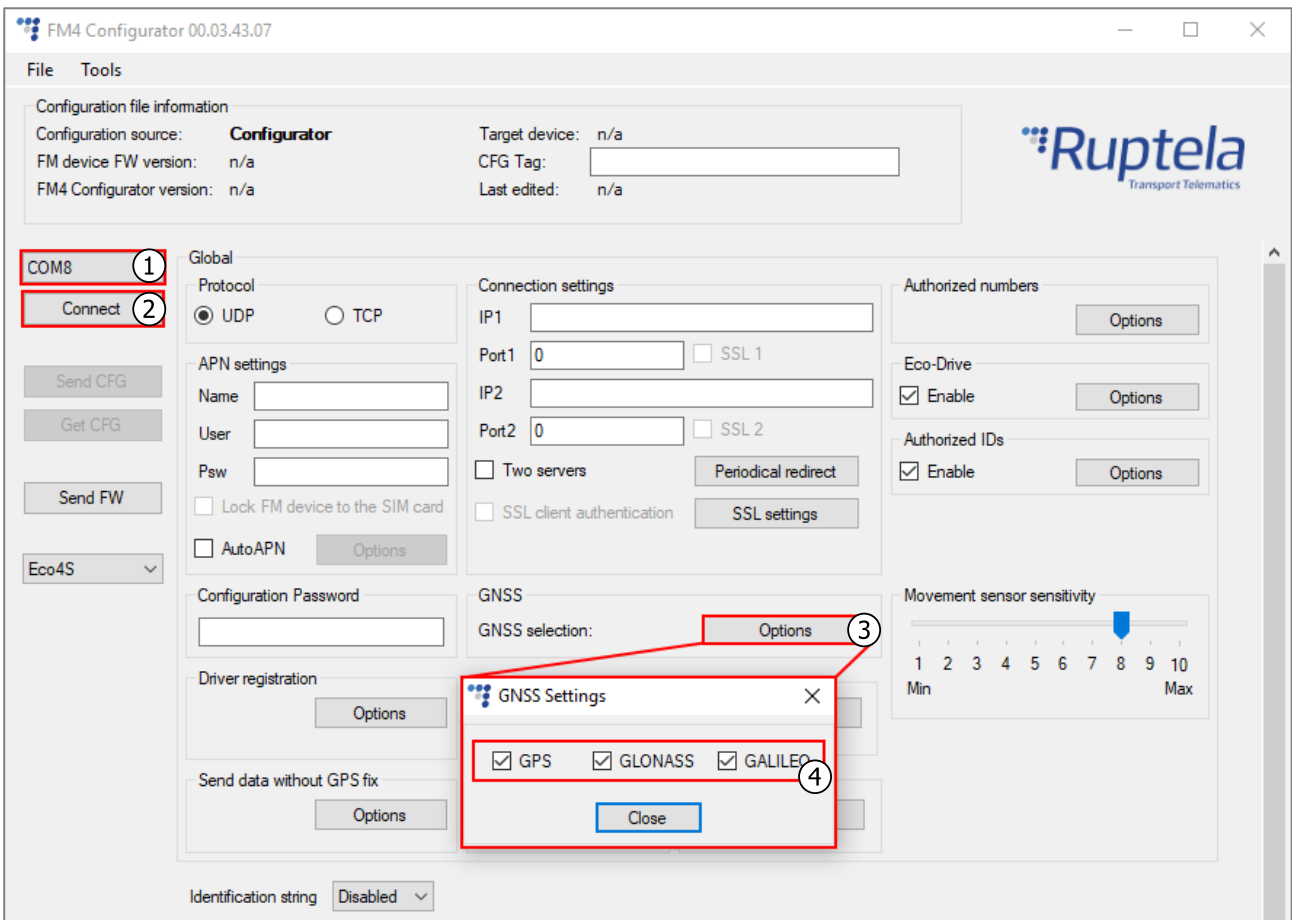
 This functionality requires the use of the advanced configurator.

 Instructional video available on YouTube: [Click here](#)

### 2.1 Starting the Configuration and GNSS Settings

To start the configuration, follow these steps:

1. Open the advanced configurator. Select the COM port to which your device is connected.
2. Click **Connect**.
3. Click **Options** in **GNSS**. A new **GNSS Settings** window will open.
4. Make sure that all 3 checkboxes are ticked.



The screenshot displays the FM4 Configurator 00.03.43.07 interface. The main window is titled "FM4 Configurator" and contains several sections:

- Configuration file information:** Shows configuration source as "Configurator", target device as "n/a", and other version information.
- Global:** Includes a "COM8" dropdown menu (circled 1) and a "Connect" button (circled 2).
- Connection settings:** Contains fields for IP1, Port1, IP2, and Port2, along with checkboxes for SSL 1, SSL 2, Two servers, and SSL client authentication.
- GNSS:** Features a "GNSS selection" dropdown menu (circled 3) with an "Options" button.
- GNSS Settings (pop-up window):** A smaller window titled "GNSS Settings" is open, showing three checked checkboxes: "GPS", "GLONASS", and "GALILEO" (circled 4), and a "Close" button.
- Authorized numbers, Eco-Drive, Authorized IDs, and Movement sensor sensitivity:** These sections contain various options and sliders.

## 2.2 GPS Navigation Filtering Configuration

✓ A full functionality description: [Configurable navigation filtering](#).

Click **Customize** next to **GPS navigation filtering** in **Data collection**. A new **Navigation filtering** window will open.

Enable the stationary and active navigation filters by ticking the corresponding checkboxes.

**i** The engine source must be *Ignition (DIN4)* or *Custom*.

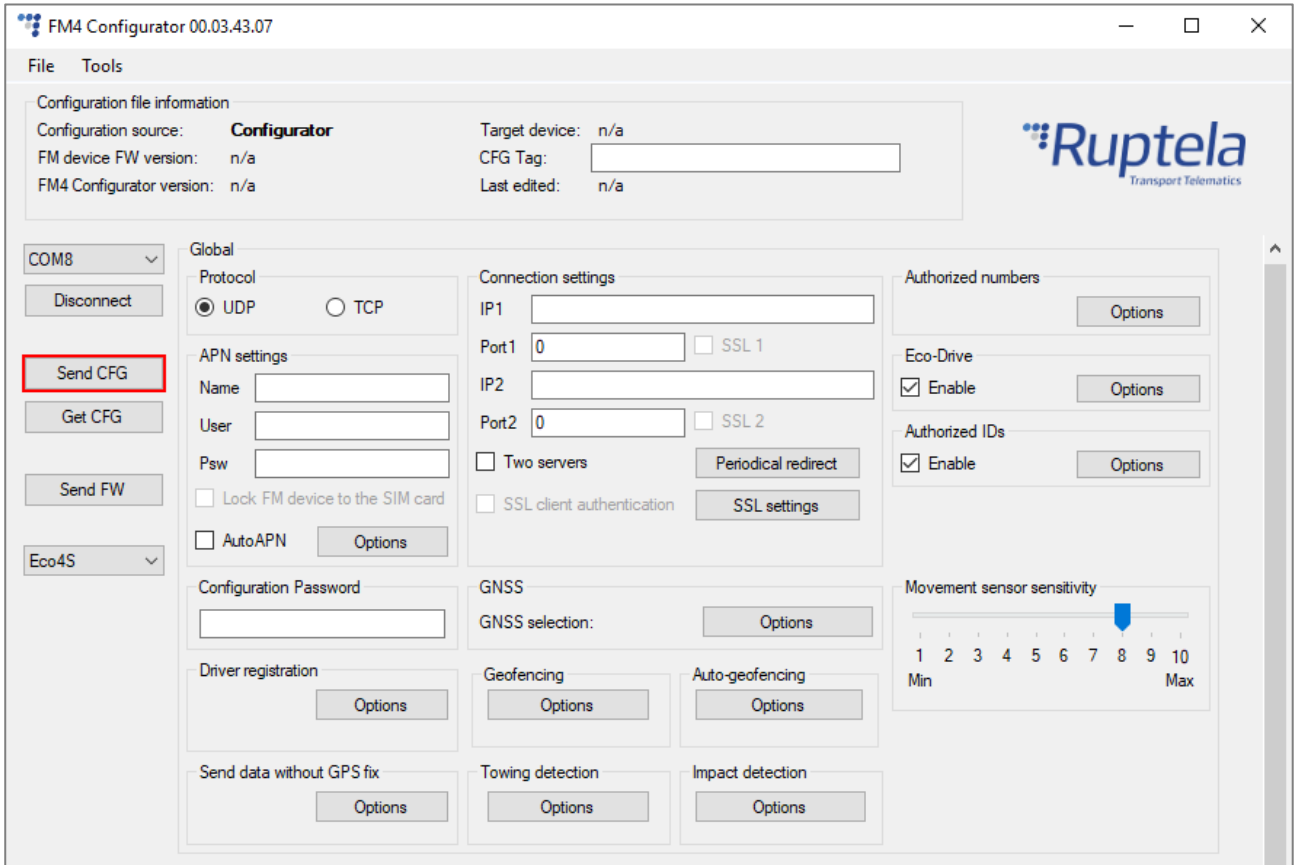
Configure the filters as shown in the image below.

The screenshot displays the FM4 Configurator 00.03.43.07 interface. The main window is titled "FM4 Configurator 00.03.43.07" and features a menu bar with "File" and "Tools". The interface is divided into several sections:

- Configuration file information:** Shows "Configuration source: Configurator", "FM device FW version: n/a", "FM4 Configurator version: n/a", "Target device: n/a", "CFG Tag: [input field]", and "Last edited: n/a".
- Global settings:** Includes "COM8" dropdown, "Disconnect" button, "Send CFG", "Get CFG", "Send FW", "Eco4S" dropdown, "Protocol" (UDP/TCP), "APN settings" (Name, User, Psw), "Lock FM device to the SIM card" checkbox, "AutoAPN" checkbox, "Configuration Password" field, "Driver registration" button, "Send data without GPS fix" button, and "Identification string" dropdown.
- Connection settings:** Includes "IP1", "Port1" (with "SSL 1" checkbox), "IP2", and "Port2" (with "SSL 2" checkbox).
- Authorized numbers and IDs:** Includes "Authorized numbers" and "Authorized IDs" sections, each with "Options" buttons and "Eco-Drive" checkboxes.
- Movement sensor sensitivity:** A slider ranging from 1 (Min) to 10 (Max), currently set at 8.
- Navigation filtering (highlighted in red):** A modal window with the following settings:
  - Stationary navigation filter
  - Switch ON conditions: Delay: 0 s
  - Switch OFF conditions: Speed: 40 km/h, Speed duration: 5 s, Movement duration: 240 s, High priority event: Enabled
  - Note: Stationary filtering will work in profile(s): 1
  - Active navigation filter
  - Allowed acceleration: 19,6 m/s<sup>2</sup>
  - Coordinate filtering by accuracy: OFF (selected), Low, Medium, High
  - Buttons: "Close" and "Customize" (highlighted in red)
- Profile 1 settings:** Includes "Sleep" (Disabled after 600 s), "Data sending" (Enable), "Min Records" (1), "Period" (60 s), and "Link Timeout" (7 s).
- 2G - 3G:** Includes "2G - 3G" dropdown (Auto), "Operator list" button, and "IO events" button.

## 2.3 Finishing the Configuration

To finish the configuration, close the **Navigation filtering** window. Click **Send CFG** to send the configuration to the device.



## 2.4 Troubleshooting

If the above configuration does not solve your positioning issues, contact our support ([support@ruptela.com](mailto:support@ruptela.com)) to update the modem firmware. This should solve the issue.

## 2.5 Eco-Drive and Accelerometer Calibration

If all 3 GNSS positioning systems are used, **the Eco-Drive data source is automatically changed to the accelerometer (ACC)**. For this, the accelerometer needs to be calibrated. Use the *accinfo* SMS command to check if the accelerometer is calibrated.

You will receive a response, an example is shown below:

**AXL state:11** XYZo:120 -39 -945 Xc:131 -92 -94 -7 Yc:-138 97 -96 16 Zc:953 120 -39 -945

Note the **AXL state** value. If it is 11, the accelerometer is calibrated, and no further actions are needed.

If the **AXL state** value is **not** 11, send the *accreset r* SMS command to start the calibration process. This process is automatic, you will need to drive the vehicle for about 30 minutes. Status updates will be sent throughout the calibration process:

- *Acc calibration initiated. Drive normally to autocalibrate* – the requirements for autocalibration are met and autocalibration will commence.
- *Up direction found. Drive normally to finish calibration* – the calibration is in progress.
- *Calibration successful* – the calibration process finished successfully.
- *Configuration error* – the requirements for autocalibration were not met.