

# GNSS Performance Improvements

## 1 Introduction

### 1.1 About the Improvements

Numerous GNSS improvements were developed in 2019. This document explains, how to take advantage of these improvements for FM-Eco4 S devices to improve position accuracy. The following steps need to be taken:

1. Modem firmware update
2. Device firmware update
3. GNSS settings and navigation filtering configuration
4. Accelerometer calibration

Each of these steps is described in more detail.

### 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 Firmware updates

### 2.1 Modem Firmware Update



This step applies only to devices manufactured before June 2019. If your device is newer, you may skip this step. You can check the manufacture date on the serial number on the back of the device, starting with the second symbol. If it is greater than **1925**, this step does not apply.

Example: S**1846**Q1OU8\_12256450 – you will need to update the modem firmware for this device.

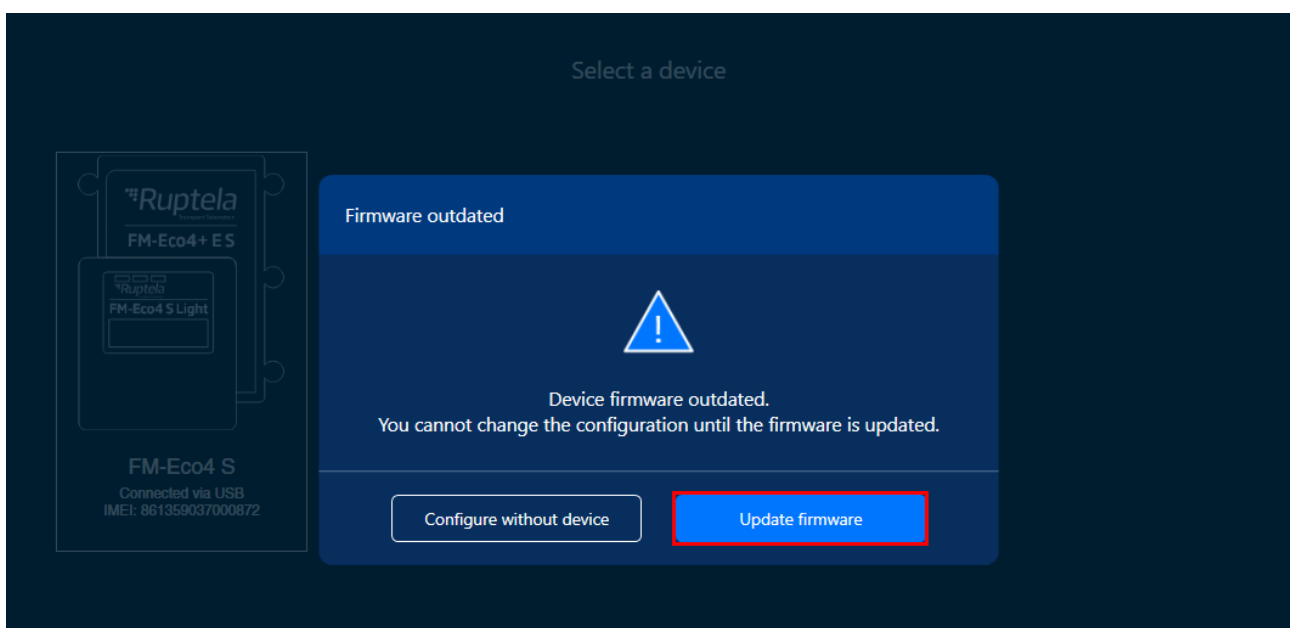
To update the modem firmware, contact our support team ([support@ruptela.com](mailto:support@ruptela.com)), they will handle the update process. The process does not take long.

If you cannot check the manufacturing date (the device is installed or the serial number is blurred out), contact our support team.

### 2.2 Device Firmware Update

To update the device firmware, download the [Device Center application](#). The firmware update process is automatic, you simply need to be connected to the internet. Connect your device and click **Update firmware** when prompted.

If you are using TrustTrack, you can contact our support team for over-the-air updates.



# 3 Configuration

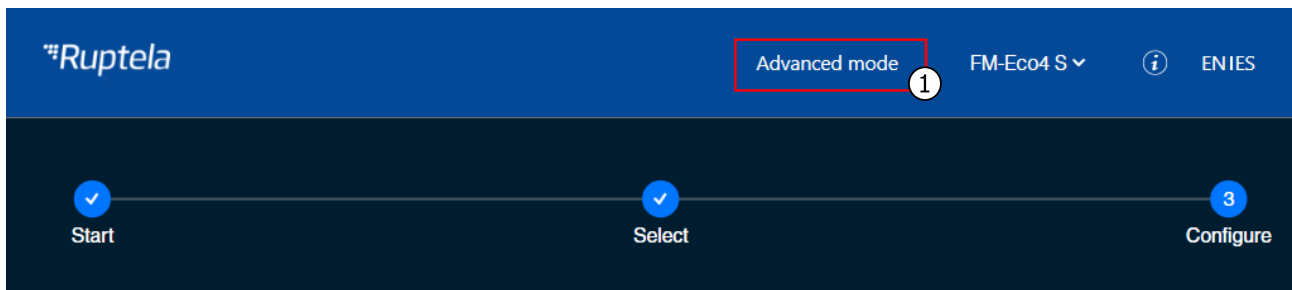
**i** This functionality requires the use of the advanced configurator.

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

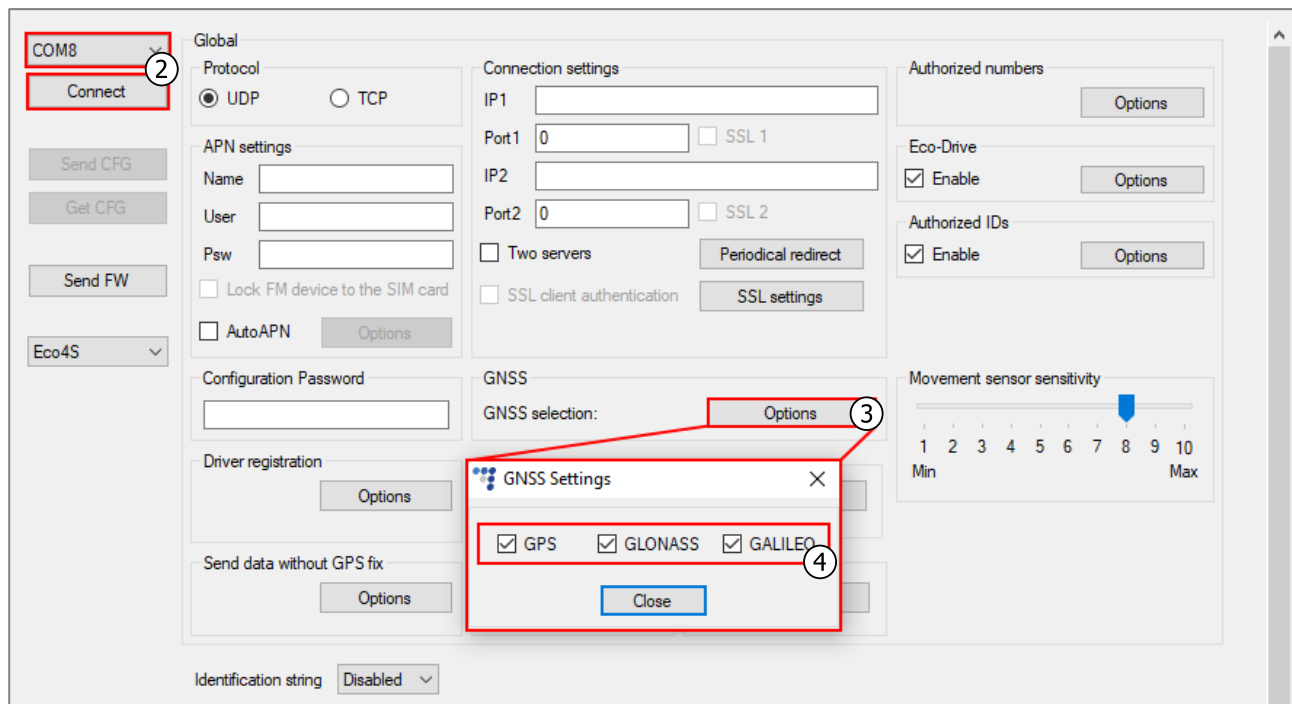
## 3.1 Starting the Configuration and GNSS Settings

To start the configuration, follow these steps:

1. Click **Advanced mode** in the Device Center to open the advanced configurator.



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



## 3.2 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*.

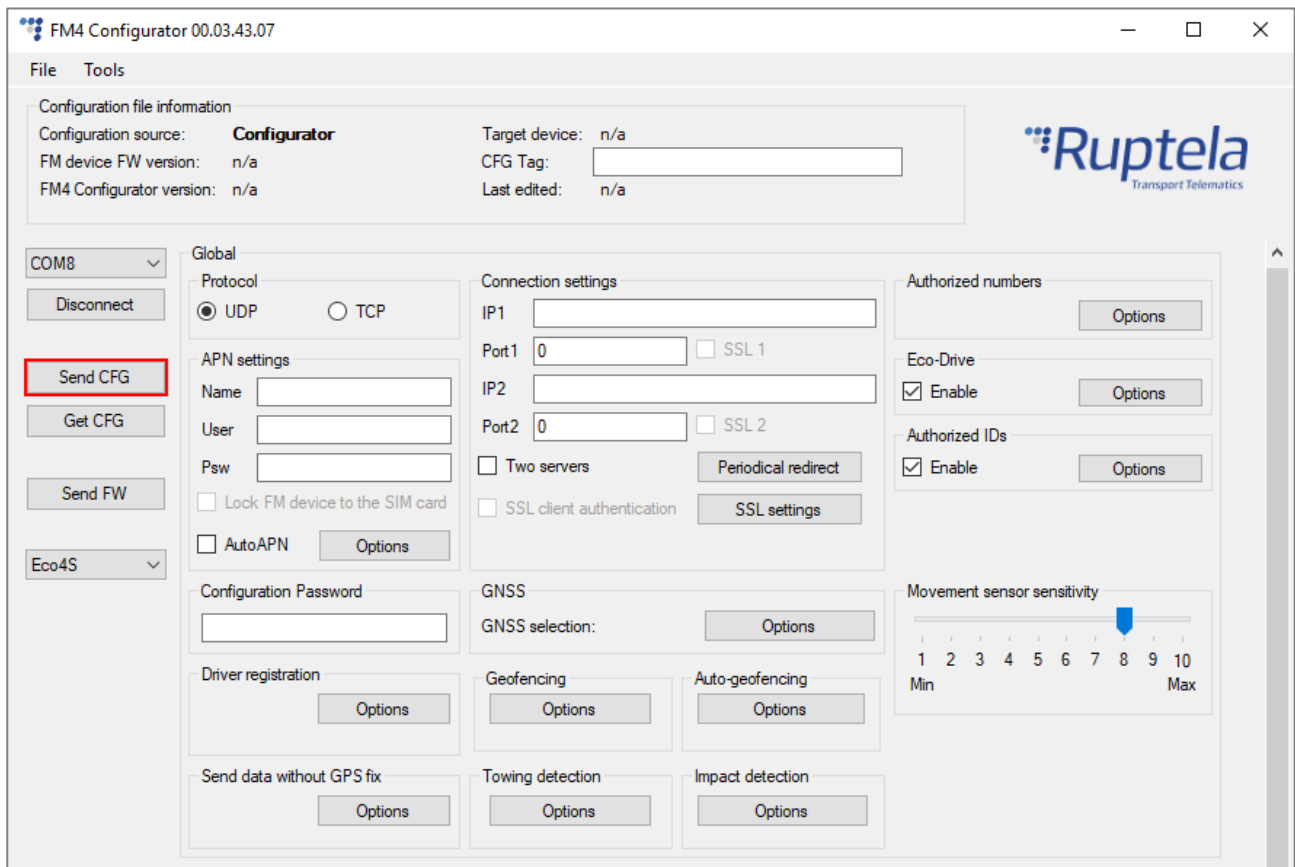
Configure the filters as shown in the image below.

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 "Auto" dropdown, "Operator list" button, and "IO events" button.

### 3.3 Finishing the Configuration

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



### 3.4 Updates Over-the-air

If you are using TrustTrack, the device firmware and configuration can be updated over-the-air. Contact our support team for more details.

## 3.5 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.