Configurable Navigation Filtering

1 Introduction

1.1 About the Functionality

Due to natural atmospheric signal delay or bad signal quality (e.g. obstructions in the environment), the device may generate inaccurate coordinates. This may result in inaccurate movement trajectories and incorrect reports. The configurable navigation filtering functionality consists of stationary and active filtering and can be configured according to user needs.

1.2 Legal Information

1.3 Compatibility

This functionality is compatible with the following devices with the newest firmware version:

- Trace5
- FM-Tco4 HCV
- FM-Tco4 LCV
- FM-Pro4
- FM-Eco4
- FM-Eco4 S
- FM-Eco4 T
- FM-Plug4

1.4 Contact Information

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1.5 Document Changelog

Version	Date	Modification
1.0	2019-01-25	Initial draft.
1.1	2019-03-05	Added: Active navigation filtering.
1.2	2019-07-12	Added: Active navigation filtering for FM-Eco4.
1.3	2019-09-27	Added: Coordinate filtering by accuracy.
1.4	2020-02-21	Updated: Stationary navigation filtering.
1.5	2020-04-03	Updated: Compatible device list.

1.6 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.

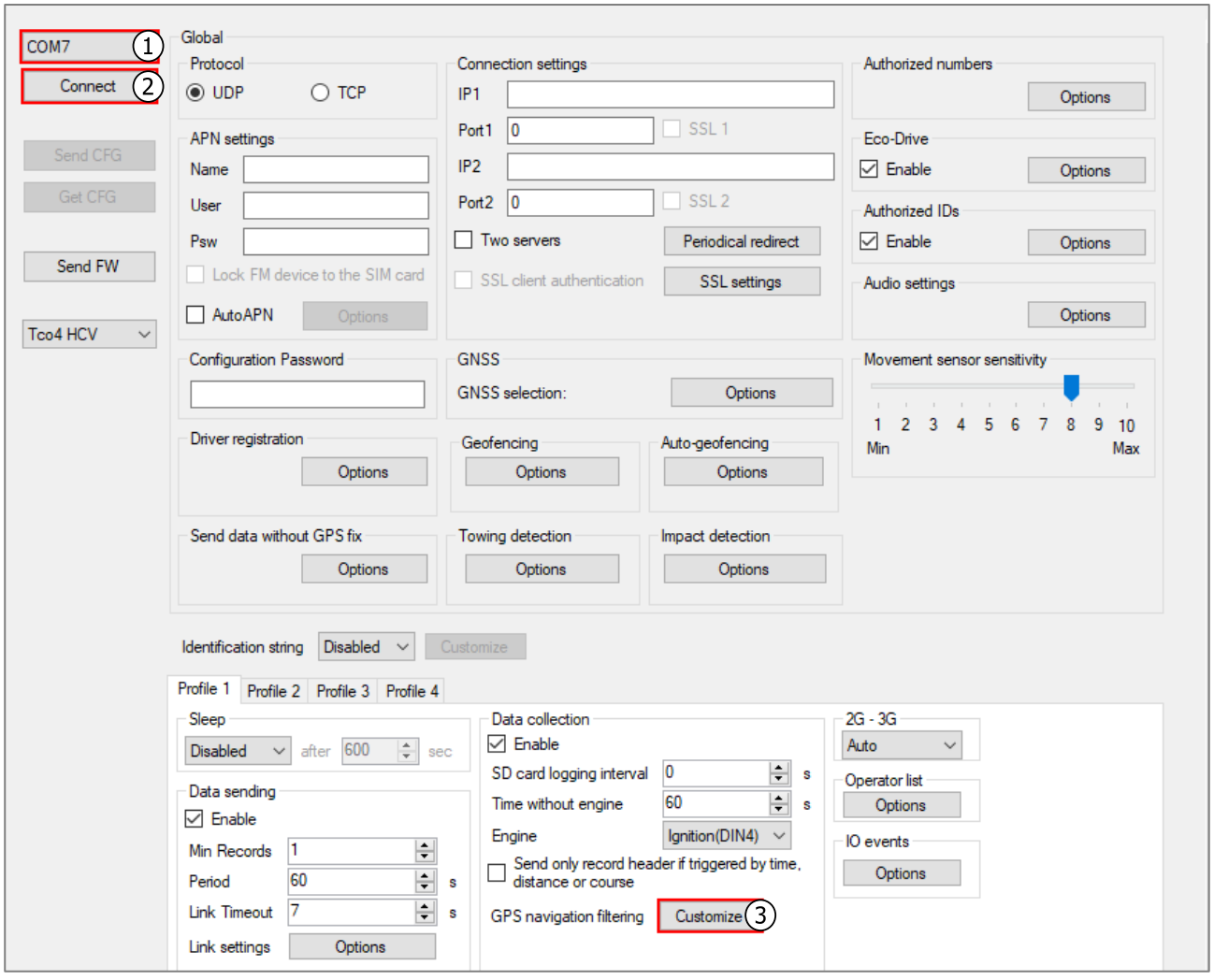
2 Configuration

This functionality requires the use of the advanced configurator.

2.1 Starting the Configuration

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. Locate **GPS navigation filtering** in the **Data collection** section. Click **Customize** to open the **Navigation filtering** window.



2.2 Stationary Navigation Filtering

The stationary navigation filter functionality solves the inaccurate coordinates issue by discarding coordinates while the vehicle is not moving.

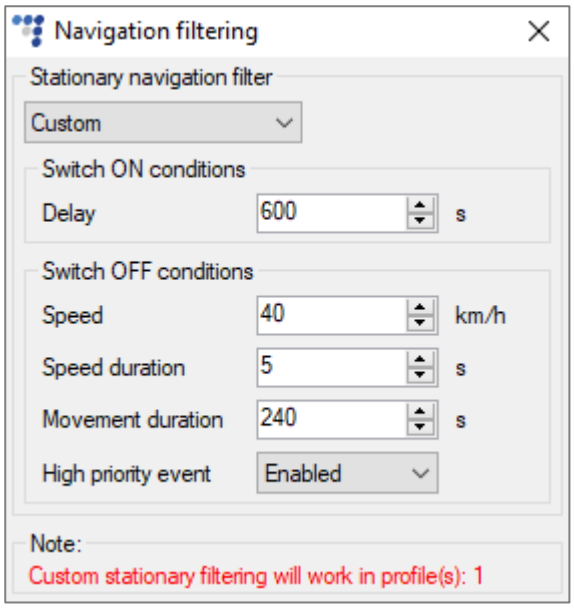
Follow these steps to configure stationary navigation filtering:

1. Select the stationary navigation filter mode.

Stationary navigation filter	The mode of the filter. The following modes are available: • *Disabled* – the filter is inactive. • *Custom* – configure the filter with your own parameter values. **Engine** *Ignition (DIN4), Power voltage* or *Custom* must be selected in the **Data collection** section. Recommended if you have a reliable ignition source, as it may be more accurate than *Automatic* mode. **Note:** The engine must be **off** to turn on the filter. • *Automatic* – this filter uses live GNSS and accelerometer data and is always on. The filter is disabled once the vehicle speed is above 3.7 km/h and is turned back on once the speed falls below 3.7 km/h. Not recommended for heavy duty and agricultural vehicles. **Note:** Delays of 2-3 seconds may occur while the filter is initializing. **Note:** Unavailable for FM-Eco4 and FM-Plug4. Default value: *Disabled*

2. If *Custom* mode is selected, configure the filter **Switch ON** and **Switch OFF** conditional parameters according to your needs.

Switch ON conditions	
Delay	For how long the engine must be turned off for the filter to be enabled. Default value: 600 s (10 minutes)
Switch OFF conditions	
Speed	The minimum speed value. The **Speed duration** condition must be met. Default value: 40 km/h
Speed duration	For how long the speed of the vehicle must be greater than or equal to the **Speed** value. Default value: 5 s
Movement duration	The minimum movement duration of the vehicle. The filter is disabled if the condition is met independently of the **Speed** and **Speed duration** conditions. Default value: 240 s
High priority event	Determines if high priority events disable the filter. • If *Enabled*, turns off the filter when a high priority event occurs • If *Disabled*, filter will not be turned off if a high priority event occurs Default value: *Enabled*



The **Note** shows in which profiles the custom stationary navigation filter is enabled. If *Ignition(DIN4), Power voltage* or *Custom* is selected as the **Engine** source in a specific profile, the functionality will be enabled in that profile.

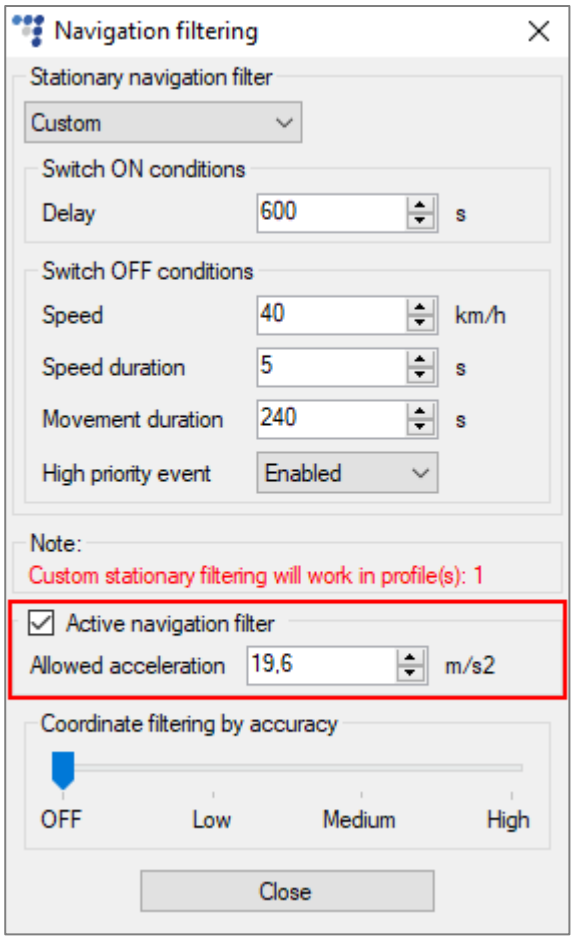
2.3 Active Navigation Filtering

The active navigation filter functionality discards inaccurate coordinates by evaluating the vehicle's movement speed. Active navigation filtering compares the GPS distance between the last two received coordinates and the maximum possible distance that is calculated by the device. If the GPS distance is greater than the calculated maximum possible distance, then the latest GPS coordinate is discarded.

Follow these steps to configure active navigation filtering:

1. Tick the **Active navigation filter** checkbox. **Engine** *Ignition (DIN4)* or *Custom* must be selected in the **Data collection** section.

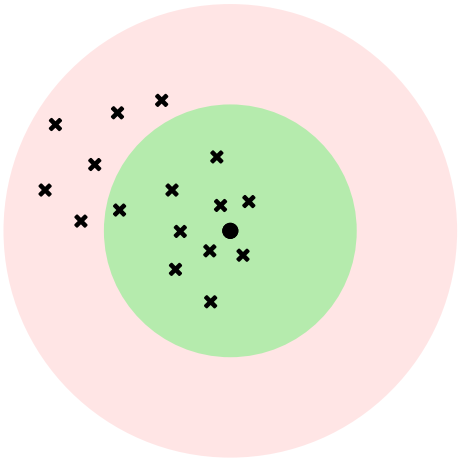
Allowed acceleration	Used in the calculation of the maximum possible distance. Default value: 19.6 m/s^2



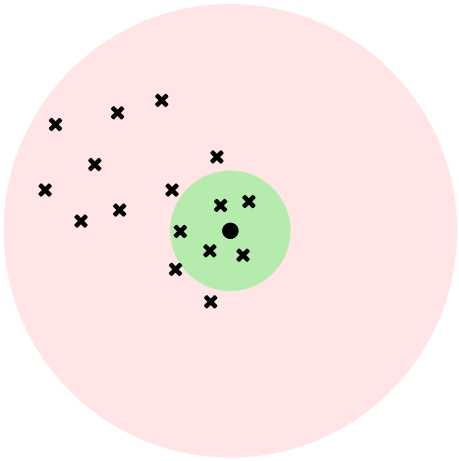
2.4 Coordinate Filtering by Accuracy

The coordinate filtering by accuracy functionality filters inaccurate coordinates caused by random jumps in position when the GNSS signal is weak. When the device receives a GNSS packet, the accuracy of the received coordinates is compared to a configured accuracy threshold. If the accuracy is worse than the threshold, the received coordinates are considered inaccurate and are filtered.

An example of accurate (green) vs. inaccurate (red) coordinates with different accuracy is provided below:



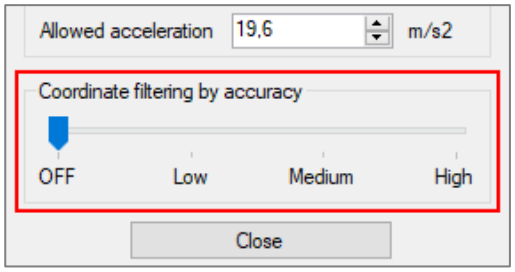
Low accuracy



High accuracy

Coordinate filtering by accuracy has one configurable parameter:

Coordinate filtering by accuracy	Sets the coordinate accuracy. The higher the accuracy, the more coordinates are filtered. We recommend using a lower accuracy, unless you are sure the GNSS signal quality is excellent. Possible values: • *OFF* • *Low* (recommended) • *Middle* • *High* Default value: *OFF*



The higher the accuracy, the more records you should generate to ensure accurate tracking, otherwise a higher accuracy will filter too many coordinates.

Coordinate filtering may affect Eco-Drive and geofencing functionality accuracy.

2.5 Finishing the Configuration

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