Setting Track by means of the Tracking Device

User Manual

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Necessary Tools, Devices, Materials

For the track setting by means of the tracking device one should have:

1. The Galileosky satellite monitoring GPS tracking device (hereinafter – tracking device) of one of versions. Detailed information about the tracking device`s connection and setting can be found by following the link: https://galileosky.com/podderzhka/dokumentacziya.html

2. Windows-based computer with the installed program of configuration of the tracking devices – “Configurator”. It is recommended to install the latest version of the program from the website https://galileosky.com/podderzhka/dokumentacziya.html
General Information

Galileosky tracking devices have considerable settings for the points recording and track drawing. The user has the following opportunities:

1. Period setting of the points recording at stop;
2. Period setting of the points recording in motion;
3. Setting of the detailed track drawing in motion;
4. Setting of the false coordinates filtering in motion and at stop.
Period Setting of the Point Recording at Stop

Period setting of the points recording can be carried out both by means of the Configurator and commands, sent to the tracking device.

Make the following actions to set the period of the points recording at stop:

1. Launch the Configurator;
2. Go to «Settings» tab -> «Track»;
3. Set necessary value in seconds in «During stop» field of «Period of recording points» section (Pic.1.);
4. Press «Apply» button.

Thus, being at the stop, the tracking device will record points with the frequency, specified in «During stop» field.

Note that stop can be identified by several methods:

- by accelerometer;
- by set ignition input;
- by power supply voltage by stopped/started engine.

By default, stop is identified with the help of built-in accelerometer.

Stop Determination by Accelerometer

For the stop identification according to the accelerometer data, it is necessary to set the following parameters on «Settings» tab -> «Track» (Pic.2.):

1. «Threshold» - acceleration value, above which the vibration is determined, corresponding to the engine operation or vehicle traffic.

Recommended value for the correct stop identification– from 40 and more;

The higher the operating threshold of the accelerometer, the lower its sensitivity and vice versa.
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2. «Timeout».

When the tracking device identifies the stop according to the accelerometer data, «stop» value will be displayed in «Motion (using accelerometer) » field on «Device» tab of the Configurator (Pic.3)

Detailed description of the accelerometer parameters settings can be found in «Accelerometer configuring – determination of strike and incline, driving style» manual in the correspondent website sectionhttps://galileosky.com/podderzhka/dokumentacziya.html.
Stop Determination by Ignition Sensor

For stop determination by the ignition input, it is necessary to make the following actions:

1. Connect the ignition sensor to one of the tracking device`s discrete-analog inputs;
2. Set limits of the discrete signal triggering on «Settings» tab-> «In/Out» in the Configurator. For example, for the vehicle, operating with 12 volts battery, discrete signal limits can be the following:
   - Logical zero zone from 0 to 5999;
   - Logical one zone from 6000 to 32000.
3. Go to «Settings» tab-> «Track» and choose the correspondent input in «Ignition in» field;
4. Press «Apply» button.

Thus, if there is no triggering at the specified input, the vehicle is considered to be not started, and coordinates are not updated, the tracking device records points and sends to the server according to the period, specified in «During stop» field.

Stop Determination by Power Supply Voltage by Stopped/Started Engine

For stop determination by power supply voltage by stopped/started engine, it is necessary to make the following actions:

1. Stop the vehicle`s engine for 5 minutes;
2. Go to «Device» tab of the Configurator and remember the value of Vsup parameter;
3. Go to «Settings» tab -> «Track» and enter this value in «Stalled engine voltage» field (Pic.6);
4. Start the vehicle`s engine;
5. Go to «Device» tab and remember the value of Vsup parameter;
6. Go to «Settings» tab -> «Track» and enter this value in «Started engine voltage» field (Pic.6);
7. Press «Apply» button.
Thus, the tracking device identifies a stop and filters «coordinates crowding», if the power supply voltage is less than the value, which is the middle between «High level» and «Low level» parameters. As for example in Picture 8, if the power supply voltage is less than 18000 mV, the tracking device will identify a stop and record points according to the period, specified in «During stop» field.

In addition, configured filtering of false coordinates will operate at stop, it is described in more details in «False coordinates filtering» section of this user’s manual.

If several parameters are set on the tracking device simultaneously, which are used for the stop determination, they will have the following priority:

− 1 priority: ignition sensor/power supply voltage;
− 2 priority: accelerometer.

There is Table 1 below, in which the indicator of stop determination is specified, depending on parameters, set on the tracking device.

<table>
<thead>
<tr>
<th>Tracking device`s settings (+ set, - not set)</th>
<th>Stop determination indicator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ignition sensor (ignition)</td>
<td>Power supply voltage (mhours)</td>
</tr>
<tr>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
</tr>
</tbody>
</table>

Table 1. Procedure of the tracking device`s stop determination.
Period Setting of the Points Recording in Motion, Setting of the Detailed Track Drawing

Period setting of the points recording in motion can be carried out both with the help of the Configurator and commands, sent to the tracking device.

For period setting of the points recording in motion, make the following sequence of actions:

1. Launch the Configurator;
2. Go to «Settings» tab -> «Track»;
3. Specify the necessary value in seconds in «In motion» field of «Period of recording points» section (Pic.7);
4. Press «Apply» button.

In addition to period setting of the points recording to the tracking device`s memory (or to microSD card), parameters of the track drawing can be configured, which also influence the frequency of points recording.

Setting of the detailed track drawing can be conditionally divided into several subtasks:

1. Setting of the track drawing on turns and angles;
2. Setting of additional points recording by exceeding a certain distance;
3. Setting of additional points recording by exceeding a specified speed.
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Setting of the track drawing on turns and angles.

For setting of more frequent recording of points on turns and angles, make the following actions:

Go to «Settings» tab -> «Track» of the Configurator;

1. In «Speed» field of «Turning» section specify the lowest speed of the vehicle, by which the tracking device triggers with the point recording on a turn;
2. In «Angle» field specify the angle, by turning to which an additional point shall be recorded (provided that the vehicle`s speed exceeds the minimum speed, specified in the point 2 of the setting);
3. Press «Apply» button.

There is an example of the tracking device setting to draw the track on turns and angles in Picture 8.

<table>
<thead>
<tr>
<th>Turning</th>
<th>3 km/h</th>
<th>7 °</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. angle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance</td>
<td>150 m</td>
<td></td>
</tr>
<tr>
<td>Speeding point record</td>
<td>60 km/h</td>
<td></td>
</tr>
<tr>
<td>Speeding interval</td>
<td>20 km/h</td>
<td></td>
</tr>
</tbody>
</table>

Thus, by vehicle`s moving at the speed of 3 km/h and more, the tracking device responses with the recording of an additional point every time by turning to the angle of 7 degrees and more.

Setting of additional points recording by exceeding a certain distance

For setting of additional points recording by exceeding a certain distance, specify a distance in meters on «Settings» tab -> «Track» in «Distance» field of «Turning» section.

There is an example of the tracking device`s setting in Picture 9. Thus, the tracking device will record an additional point every 300 meters (except those ones, which are recorded on the basis of the specified period of points recording in motion).

<table>
<thead>
<tr>
<th>Turning</th>
<th>3 km/h</th>
<th>7 °</th>
</tr>
</thead>
<tbody>
<tr>
<td>Min. speed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Min. angle</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Distance</strong></td>
<td>300 m</td>
<td></td>
</tr>
<tr>
<td>Speeding point record</td>
<td>60 km/h</td>
<td></td>
</tr>
<tr>
<td>Speeding interval</td>
<td>20 km/h</td>
<td></td>
</tr>
</tbody>
</table>

Pic. 8  
Setting of the track drawing on turns and angles

Pic. 9  
Example of the terminal`s setting for points recording every 300 meters
Setting of additional points recording by exceeding a specified speed

For setting of additional points recording by exceeding a specified speed, make the following actions:

1. On «Settings» tab -> «Track» in «Speed exceed» field in «Turning» section specify the necessary speed value;
2. In «Speed delta» field specify the maximum deviation step of the next speed value from the previous one, by which an additional point is recorded.

There is an example of the tracking device’s setting in Picture 10.

In «Speeding point period» field the value of 60 km/h is specified.
In «Speeding interval» field the value of 20 km/h is specified.

Thus, by vehicle’s achieving the speed of 80, 100, 120 km/h and etc., an additional point will be recorded.

![Example of the terminal setting to record points by exceeding a specified speed](Pic. 10)
False Coordinates Filtering

Configured false coordinates filtering also influences the track making.

If the coordinates filtering is activated on the tracking device, those messages, which correspond to filtering parameters, will be filtered out, and a previous point, which has preceded the executed filtering, will be recorded to the tracking device’s memory.

That’s why it is recommended to check the correctness of filtering settings to prevent data from loss.

For the activation of false coordinates filtering, it is necessary to make the following actions:

1. Go to «Settings» tab -> «Track» of the Configurator (Pic. 11);
2. Tick «GPS correction»;
3. Set parameters’ values, according to which filtering is executed;
4. Press «Apply» button.

Coordinates filtering can also be activated and set with the help of «GPS.Correct» and «GPS.Correct2» commands.

Let us consider main parameters, relating to the false coordinates filtering.

1. «Max wrong» - this parameter allows to filter out the specified number of wrong coordinates, recommended value is equal to 5.

The parameter considers errors of the specified acceleration and jump exceedance, coordinates filtering always operates for other parameters.

Thus, if value of this parameter is equal to 5, first five error messages (coordinates acceleration and jump for which exceed the specified value) will be filtered out, then one message will be

![Pic. 11 Setting of false coordinates filtering](image-url)
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recorded to the tracking device’s memory. After that, points will continue being recorded to
the memory until correct coordinates are received.

2. «Max HDOP» – maximum HDOP value (Horizontal Dilution of Precision – accuracy
degradation in a horizontal plane), above which coordinates are filtered out.

As an example in Picture 11, all messages with HDOP of more than 5 will be filtered out.

3. «Max speed»

All messages with the speed, higher than the specified value, will be filtered out by the tracking
device.

For example, maximum speed is 150 km/h, it means that if vehicle moves at the speed of more
than 150 km/h, points with higher speed of a vehicle will be replaced by the previous one,
speed in which is lower than 150 km/h.

It is necessary to pay attention to this setting as if the speed is specified incorrectly in this field,
it can lead to the track discontinuity on the map.

4. «Max acceleration» - in this field the maximum acceleration of the vehicle can be
specified according to GPS/GLONASS data. Messages with the acceleration, higher
than the specified one, will be filtered out in accordance to parameter 1.

As an example in Picture 11, the following parameters are specified:

«Max acceleration» - 10 m/s²;
«Max wrong» - 5.

Thus, five messages, containing the acceleration of more than 10 m/s², will be filtered out, one
message is recorded. Than points will continue being recorded to the memory until correct
coordinates are received.

5. «Max jump»

If the coordinates jump exceeds the specified value in the nearest two seconds, this point will
be filtered out.

As an example in Picture 11, five values with the coordinates jump, higher than the specified
one, will be filtered out, one value is recorded. Then points will continue being recorded to the
memory until correct coordinates are received.

6. «Min travel speed»

If a vehicle moves at the speed, which is lower than the specified one, these points will be
considered as incorrect ones and filtered out by the tracking device.

The tracking device will continue recording coordinates of the previous point to the memory.

ATTENTION! This function is not suitable for slow-speed vehicles (tractors, asphalt laying
machines), for avoiding mistakes in track formation, it is recommended to specify 0 in the
mentioned above field for these vehicles by the activated false coordinates filtering.
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7. «Max no satellite time». Connection loss is not recorded during this time.

8. «Minimum satellite count on start».

Determines the minimum number of satellites, with which the connection should be established by the tracking device`s turning on. If the tracking device determines less satellites by the turning off, these points are filtered out.

9. «Minimum satellite count when work».

Determines minimum number of satellites, with which the connection should be established during the tracking device`s operation.

There is an example of the high-grade track drawing in monitoring software in Picture 12.

Pic. 12
Example of the track drawing in monitoring software

Setting of track drawing parameters by means of the Galileosky tracking device is finished, tracking device is ready to operate.

RSA “Galileosky”, LLC produces satellite monitoring equipment for GPS and GLONASS real time vehicles monitoring. The tracking devices determine the mobile object location recording the time and route as points with geographical coordinates and send the data to the server to be further processed and sent to the traffic controller panel.

In addition, a number of other vehicle parameters are recorded: the state of analog and discrete inputs of the tracking device and the state of digital interfaces.

The tracking devices can be used in any vehicle.