DAI. Connecting Analog and Frequency Fuel Level Sensors

User Manual
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**Necessary Tools, Devices, Materials**

To connect Galileosky tracking device (hereinafter – tracking device, device) you should have:

1. Electrical tools.
2. Set of connecting wires with fuses.
3. Windows-based computer with the installed program of configuration of Galileosky tracking devices – "Configurator". It is recommended to install the latest version of the program from the site [https://galileosky.com/podderzhka/programmyi.html](https://galileosky.com/podderzhka/programmyi.html)
General Information

Galileosky devices can read in frequency signal and process it in accordance with customized algorithm. As signal sources analog and frequency fuel level sensors (hereinafter – frequency FLS) of different manufacturers can be used (Pic. 1).

Principle of work of an analog FLS is based on converting measured electric capacity into voltage, depending on the fuel level in the tank. Voltage value on the sensor output depends on the FLS model and, as a rule, the range is from 0 to 20 V, but not higher than connection voltage of the sensor.

Principle of work of a frequency FLS is based on converting measured electric capacity into frequency signal in proportion to fuel level in a tank. Signal frequency depends on the FLS model and is usually from 100 to 4000 Hz; signal amplitude also depends on the FLS model, but is not higher than connection voltage of the sensor (Pic. 2).
Fuel Level Sensor Connection

Install a fuel level sensor into a tank of a vehicle according to manufacturing factory recommendations (Pic. 3).

Pic. 3
Installation of a FLS into a tank
Connection and Setting of Analog Fuel Level Sensor

Connecting of an analog fuel level sensor to a Galileosky device should be done in accordance with the scheme, presented in Picture 4 of this manual. Analog output of a FLS is to be connected to one of the discrete analog inputs (hereinafter - DAI) of the device. Negative input of the FLS should be connected to the negative side of power supply of a Galileosky tracking device.

To set Galileosky tracking device for operating with analog FLS it is necessary to perform the following:

- Connect to the device via Configurator service program, go to tab Settings -> Ins/Outs. For the input that is engaged with the FLS set the filter type “Mean value” and “filter length” 5, then click “Apply” button (Pic. 5)

- Start the car, go to tab “Device” of the Configurator and make sure the signal from FLS is transmitted to Galileosky device. (Pic. 6) After it, you need to perform calibration of FLS in accordance with the manufacturer’s recommendations.

Pic. 4
Analog FLS connecting scheme

Pic. 5
Input setting

Pic. 6
Checking the analog signal from FLS
Connection and Setting of Frequency Fuel Level Sensors

Connecting of a frequency fuel level sensor to a Galileosky device should be done in accordance with the scheme, presented in Picture 7 of this manual. Frequency output of a FLS is to be connected to one of the discrete analog inputs (hereinafter - DAI) of the device. Negative input of the FLS should be connected to the negative side of power supply of a Galileosky tracking device.

In case if a manufacturer of FLS has not provided shifting of a frequency signal to “+” power, 10kOhm resistor R1 must be connected additionally.

To set Galileosky tracking device for working with frequency FLS it is necessary to connect the device to Configurator service program and go to tab Settings -> Ins/Outs. Setting the discrete analog inputs is carried out in two stages:

1. Stage 1. To measure the average amplitude of a frequency signal:
   - Select the filter type “middle value”;
   - Set the filter length as “50”; 
   - Run the engine;
   - Go to the “Device” tab and slightly increasing the engine speed for 1 minute detect the mean value of the signal amplitude, that comes to the custom input (Pic. 8).
If the manufacturer has indicated frequency signal amplitude in the documentation the target value is equal to half of that amplitude.

2. Stage 2. Filter settings to operate with frequency FLS:

- Go to tab “Ins/Outs” tab and set filter type “frequency counting”;
- Set the filter length as “1”;
- Set discrete signal limit to the average amplitude value measured at the first stage (Pic. 9);
- Go to the “Settings” tab –> “Protocol” and in the main packet settings tick the DAI fields to which frequency fuel level sensors are connected (Pic. 7);
- Click “Apply” button;
- Run the engine and perform calibration of FLS in accordance with manufacturing factory recommendations.
Setting the Tracking Device for operation with Monitoring Software

Go to tab Settings -> Protocol and for the Main packet tick those discrete analog inputs, where analog or frequency FLS is connected (Pic. 10).
Setting the Monitoring Software for Cooperation with FLS

After analog input of Galileosky tracking device has been configured monitoring software should be configured (hereinafter – Monitoring software). It should be done in accordance with software manufacturer recommendations. As a rule, it is necessary to create a sensor in the monitoring software and fill in the calibration table for its values:

- Measured FLS values are transmitted by Galileosky tracking device to the server as absolute values which the tracking device has registered;
- On monitoring server mathematical computation of fuel level in accordance with calibration table values and calculation formula is performed;
- Graphical user table reports on fuel level and fuel consumption are based on the calculated values (Pic. 11, 12).

The connection of analog and frequency fuel level sensor to Galileosky tracking device is completed. The 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.