Contents

Necessary Tools, Devices and Materials ........................................... 3
General Information ........................................................................ 4
Connection of FLS Using RS232 Interface ...................................... 5
Connection of FLS Using RS485 Interface ....................................... 7
Monitoring Software Setting .............................................................. 10
Necessary Tools, Devices and Materials

To connect the digital fuel level sensors to Galileosky tracking device (hereinafter – tracking device) one should have:

1. Electrical tools.
2. Set of connecting wires
3. Windows-based computer with the installed program of configuration of Galileosky tracking units – “Configurator”. You can download the latest version of it here https://galileosky.com/podderzhka/programmyi.html
General Information

The Tracking devices can read in digital signal via RS-232 or RS-485 interface. As a source of digital signal digital fuel level sensors of different manufacturers can be used (Pic. 1).

Principle of work of a digital FLS is based on converting of data of fuel level in a tank into electric capacity, which is measured by the electronic module of the FLS. The module converts this capacity to a digital code and transmits it to the tracking device.

Install a fuel level sensor into a tank of a vehicle according to manufacturing factory recommendations (Pic. 2).
Connection of FLS Using RS232 Interface

Connection of a FLS using RS232 interface is to be carried out according to the scheme of Picture 3.

For tracking devices, which have the second RS232 port, it is possible to use still RXD1 and TXD1 contacts.

**ATTENTION!** Grounds (GND) of the tracking device and the FLS must be connected; RS232 contacts must be connected strictly according to the scheme RXD of the FLS - TXD0 of the tracking device and TXD of the FLS - RXD0 of the tracking device. The FLS power supply is provided separately.

The order of setting is the following:

1. Set RS232[0] (RS232[1]) input of the tracking device for receiving relative fuel level (N) or frequency from the sensor (F) (Pic. 4):
   1.1. go to the “Settings” tab -> “Digital inputs” of the Configurator and select “Digital FLS, relative fuel level (N)” or “Digital FLS, frequency (F)” (depending on which parameter needs to be transferred to the server and, how the setting of the FLS was performed in the Configurator) or you may send RS2320 1 or RS2320 2 command in the “Commands” tab;

**ATTENTION!** When performing the FLS settings in the program Configurator it is necessary to specify the binary protocol supported by the majority of producers of sensors as the data exchange protocol with external devices. The FLS can be configured to periodically delivery once a second (or not less than once in 18 seconds);
(version 3 dated from August 8, 2018)

1.2. if you need to filter bursts of fuel adjust filter length having established the necessary value of averaging of readings, or send DFilter n command in the “Commands” tab (where n – filter length, at value of 1 readings are transferred without processing);

**ATTENTION!** Temperature value transmitted by the FLS is saved only when you enable the dynamic structure of the archive;

```plaintext
<table>
<thead>
<tr>
<th>Security</th>
<th>Data transmission</th>
<th>Protocol</th>
<th>Power setting</th>
<th>Track</th>
<th>In/Out</th>
<th>Digital inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS232</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS485</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

1.3. press “Apply” button;

1.4. go to the “Settings” tab -> “Protocol” of the Configurator, adjust the main packet for RS232[0] or RS232[1] input data transmission to the server (Pic. 5) and press “Apply” button; or send MainPackBit 22,1 (MainPackBit 23,1, if the FLS is connected to RS232[1] port) command in the “Commands” tab;

```plaintext
<table>
<thead>
<tr>
<th>Security</th>
<th>Data transmission</th>
<th>Protocol</th>
<th>Power setting</th>
<th>Track</th>
<th>In/Out</th>
<th>Digital inputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN0</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IN3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS232[0]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RS232[1]</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
```

1.5. go to the “Device” tab of the Configurator and reset the tracking device using “Reset device” button or send Reset command in the “Commands” tab.

2. Make sure that the tracking device receives data from the sensor: to do this go to the “Device” tab of the Configurator and check if there are the readings received from the FLS (Pic. 6):

```plaintext
<table>
<thead>
<tr>
<th>Analogs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>In 0</td>
<td>0</td>
</tr>
<tr>
<td>In 1</td>
<td>0</td>
</tr>
</tbody>
</table>
```

or go to the “Troubleshooting” tab of the Configurator, tick the field «RS232[0]» - message of the following form will appear in troubleshooting (Pic. 7):

```
RS232[0].LLS[258] T = 0; N = 2617; F = 9548;
RS232[0].LLS[258] Request data
```

**ATTENTION!** If the tracking device receives no messages from the sensor for 18 seconds the RS232 field value will be nullified. In this way it is possible to detect sensor disconnection or failure.
Connection of FLS Using RS485 Interface

Connection of a FLS using RS485 interface is to be carried out according to the scheme of Picture 8.

ATTENTION! Grounds (GND) of the tracking device and the FLS must be connected! The FLS power supply is provided separately.

The tracking device supports connection up to 16 sensors at the same time. The sensors should have the addresses 0, 1, 2, ..., 15 correspondingly. Operation mode is the following: FLS waits for a request from the tracking device, after receiving the request the sensor sends a response that includes information on the level and temperature. Only those requests in which the network address matches the address recorded in the memory of the sensor are served.

The setting order is the following:

1. Set RS485 input of the tracking device for receiving data from the FLS (Pic. 9):
   1.1. Go to the “Settings” tab -> “Digital inputs” of the Configurator and select «Photocamera and FLS» or send RS485fn 2 command in the “Commands” tab;
ATTENTION! When performing the FLS settings in the program Configurator it is necessary to specify the binary protocol supported by the majority of producers of sensors as the data exchange protocol with external devices. The FLS should be configured to delivery upon request:

1.2. Press “Apply” button;
1.3. Go to the “Settings” tab -> “Protocol” of the Configurator, adjust the main packet for received data transmission to the server (Pic. 10) and press “Apply” button; or send MainPackBit n, 1 (where n may take values 77-91 depending on the address of the FLS) command in the “Commands” tab;

ATTENTION! Values of sensors with addresses from 4 to 15 and temperature from sensors with addresses from 0 to 15 are saved to the memory only when the dynamic structure of the archive is on;

2. Make sure that the tracking device receives data from the sensor: to do this go to the “Device” tab of the Configurator and check if there are the readings received from the FLS (Pic. 11):

or go to the “Troubleshooting” tab of the Configurator, tick the field «RS485» - message of the following form will appear in troubleshooting, (Pic. 12):
ATTENTION! If the tracking device receives no messages from the sensor for 18 seconds the RS485 field value will be nullified. In this way it is possible to detect sensor disconnection or failure.
Monitoring Software Setting

After setting of the digital input of the tracking device you should configure the monitoring software in accordance with recommendations of the monitoring software producer.

Digital FLS connection ends with checking of correctness of the signal transmission to the monitoring server:

1. Measured values of digital signal of the FLS are transmitted by the Tracking device to the server as absolute values which the tracking device has registered (Pic.13);

2. On monitoring server mathematical computation of fuel level in accordance with calibration table values (Pic. 14) and calculation formula is performed;

3. Graphical user table reports on fuel level and fuel consumption are based on the calculated values (Pic. 15, 16).
Connection of the digital fuel level sensor via RS232 or RS485 interfaces to the 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.