RS232/RS485. CAN-log Connection and Operation

User Manual

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Necessary Tools, Devices, Materials

To connect CAN-log device to the 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 the tracking devices – "Configurator". It is recommended to install the latest version of the program from the site https://galileosky.com/podderzhka/programmyi.html
General information

The CAN-log device (Pic. 1) is intended for controlling technical operational parameters of the modern vehicles equipped with the CAN bus, and transmission of these parameters to the interfaced device. The device connects to the CAN bus of the vehicles and is consistent with them in the software and the hardware level. The CAN-log allows you to read the required information from huge cars and trucks fleet, agricultural machinery. You can see the list here [http://farvater-can.ru/all/log/list_auto/](http://farvater-can.ru/all/log/list_auto/). With its help you can get:

1. total operation time of the engine;
2. the full mileage of the vehicle;
3. full fuel consumption since the creation of a car;
4. fuel level in tank in percentage or liters;
5. engine speed;
6. coolant temperature;
7. the speed of the vehicle;
8. axle loads;
9. state of vehicle units and emergency situation messages;
10. also, other data transmitted by CAN-bus.

![Pic. 1](http://example.com/can-log-device.png)

The CAN-log device is to be connected to external devices via RS232 and RS485 interfaces. Tracking devices have functionality of reading of a digital signal via RS232 and RS485 interfaces.
Connection of CAN-log via RS232 interface

Connection of CAN-log via RS232 interface is carried out in accordance with the schemes, presented in Picture 2.

ATTENTION! Grounds (GND) of the tracking device and the CAN-log must be connected; RS232 contacts must be connected strictly according to the scheme RX CAN-LOG - TXD0 of the tracking device and TX CAN-LOG - RXD0 of the tracking device. The CAN-log is powered separately.

Configuring of the RS232[0] input of the tracking device for connection of CAN-log can be carried out in two ways.

Configuring via the Configurator (Pic. 3):

1. go to the “Settings” tab -> “Digital inputs” of the Configurator and select “CAN-LOG” for the RS232 input
2. click "Apply" button;
3. go to the "Settings" tab -> "CAN" of the Configurator and make sure that there is the value "CAN disabled" set for the "Filter type" parameter.

Configuring by commands:
1. send RS232 6 command to the tracking device to set the CAN-log mode for the RS232 input;
2. send CANREGIME 0,250000,2000 command to the tracking device to disable the built-in CAN-bus controller.

**ATTENTION!** Make sure the number of the program is set to CAN-log in accordance with the model of connected vehicle. You can check it on the site [http://www.can-pro.ru](http://www.can-pro.ru)

Make sure that the tracking device receives information from the sensor: to do this go to the "Device" tab of the Configurator and check if there are the readings, received from the CAN-LOG (Pic. 4):

<table>
<thead>
<tr>
<th>CAN</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel consumption, l</td>
<td>12 143,0</td>
</tr>
<tr>
<td>Fuel level, %</td>
<td>76,8</td>
</tr>
<tr>
<td>Engine coolant temperature, ºC</td>
<td>50</td>
</tr>
<tr>
<td>Engine speed, rpm</td>
<td>1 200,000</td>
</tr>
<tr>
<td>Mileage, km</td>
<td>165 010,000</td>
</tr>
</tbody>
</table>

or go to the "Troubleshooting" tab of the Configurator, tick the field "RS232[0]" - and there will be the message in the troubleshooting window (Pic. 5):

**ATTENTION!** The "Device" tab of the Configurator may display not all the readings, but only those that the CAN-log transmitted depending on the type of the vehicle. Fuel level in tank is displayed in percent. In case CAN-log has transmitted fuel data in liters, they will not be seen on the tab.
Connection of CAN-log via RS485 Interface

In order to connect CAN-log to Galileosky devices via RS485 interface, a UART> RS485 connector should be used (Pic.6).

**ATTENTION!** Integration of Galileosky devices v. 5. x, v. 4. 0 with CAN-log via RS485 interface requires 230. 9 or higher version of firmware (Pic.7). As for Galileosky tracking devices 7. 0 and Base Block cooperation with CAN-log is available in all versions of the firmware.

<table>
<thead>
<tr>
<th>Select device...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identification data</td>
</tr>
<tr>
<td>Device</td>
</tr>
<tr>
<td>IMEI</td>
</tr>
<tr>
<td><strong>Firmware</strong></td>
</tr>
<tr>
<td><strong>Type</strong></td>
</tr>
</tbody>
</table>

Data on firmware of the device:

- Date and time, UTC: 14.07.2016 08:21:39
- Latitude: 58.001441
- Longitude: 56.295761
- Altitude: 0
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(version 7 dated from August 8, 2018)

Connection of CAN-log via RS485 interface is carried out in accordance with the schemes, presented in Picture 8.

![Pic. 8](image)

Scheme of CAN-log connection to the RS485 input via UART> RS485 connector

Configuring of the RS485 input of the tracking device for connection of CAN-log can be carried out in two ways:

**Configuring via the Configurator:**

1. go to the “Settings” tab -> “Digital inputs” of the Configurator and select “CAN-LOG” for the RS485 input (Pic.9);

![Pic. 9](image)

Setting of the RS485 input in the Configurator

2. click “Apply” button;
3. go to the “Settings” tab -> “CAN” of the Configurator and make sure that there is the value “CAN disabled” set for the “Filter type” parameter;
4. go to the “Device” tab of the Configurator and reset the tracking device with the help of “Reset device” button.

**Configuring by commands:**

1. send `RS485FN 6` command to the tracking device to set the CAN-log mode for the RS485 input;
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2. send CANREGIME 0,250000,2000 command to the tracking device to disable the built-in CAN-bus controller;
3. send Reset command to reset the tracking device.

Make sure that the tracking device receives information from the sensor: to do this go to the “Device” tab of the Configurator and check if there are the readings, received from the CAN-log (Pic. 10) or go to the “Troubleshooting” tab of the Configurator, tick the field “RS485” - and there will be the message in the troubleshooting window:

![Check of receiving data from RS485 input](image)

**ATTENTION!** The “Device” tab of the Configurator may display not all the readings, but only those that the CAN-log transmitted depending on the type of the vehicle. Fuel level in tank is displayed in percent. In case CAN-log has transmitted fuel data in liters, they will not be seen on the tab.
CAN-log Protocol Description and Setting the Data Transmission to the Monitoring Server

CAN-log transmits information as a set of prefixes and values of work indicators received from the vehicle. The description of the most common prefixes is given in Table 1.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Description</th>
<th>Unit measure</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>Status flags</td>
<td>-</td>
<td>S010000</td>
</tr>
<tr>
<td>A or B</td>
<td>Total operation time of the engine</td>
<td>hour</td>
<td>A012000.00</td>
</tr>
<tr>
<td>C or D</td>
<td>The full mileage of the vehicle</td>
<td>km</td>
<td>C0098000.100</td>
</tr>
<tr>
<td>E or F</td>
<td>Full fuel consumption</td>
<td>liter</td>
<td>E0000000.0</td>
</tr>
<tr>
<td>G or R</td>
<td>Fuel level in the tank</td>
<td>% or liter</td>
<td>G050.4 or R080.0</td>
</tr>
<tr>
<td>H</td>
<td>Engine speed</td>
<td>rpm</td>
<td>H2500</td>
</tr>
<tr>
<td>I</td>
<td>Engine temperature</td>
<td>C</td>
<td>1+090, 1-025</td>
</tr>
<tr>
<td>J</td>
<td>Vehicle speed</td>
<td>km/h</td>
<td>J045</td>
</tr>
<tr>
<td>K</td>
<td>Load of an axle 1</td>
<td>kg</td>
<td>K03300.0</td>
</tr>
<tr>
<td>L</td>
<td>Load of an axle 2</td>
<td>kg</td>
<td>L03300.0</td>
</tr>
<tr>
<td>M</td>
<td>Load of an axle 3</td>
<td>kg</td>
<td>M03300.0</td>
</tr>
<tr>
<td>N</td>
<td>Load of an axle 4</td>
<td>kg</td>
<td>N03300.0</td>
</tr>
<tr>
<td>O</td>
<td>Load of an axle 5</td>
<td>kg</td>
<td>O03300.0</td>
</tr>
<tr>
<td>P</td>
<td>Accident controllers</td>
<td>-</td>
<td>P02010000</td>
</tr>
<tr>
<td>Z</td>
<td>CRC checksum</td>
<td>-</td>
<td>Z0560</td>
</tr>
</tbody>
</table>

Table 1

You can get a more detailed description of prefixes at the sites of CAN-log manufacturers after sending a request for receiving a manual on setting.

To set data transmission to the monitoring server go to the “Settings” tab -> “Protocol” of the Configurator, configure the main packet (Pic. 11) and click “Apply” button.
ATTENTION! Compliance of parameters of the main packet and prefixes of the CAN-log protocol is given in the description of tags of the Galileosky protocol in user’s manuals to tracking devices (https://galileosky.com/podderzhka/dokumentacziya.html).

Despite data with constantly changing values, CAN-log transmits data on discrete events of a vehicle. All information on such events is contained in prefixes S and P (Pic. 12), for example:

- Switching starting (is contained in the second byte of prefix S, it corresponds with tag can8bit1);
- Opening driver’s door (is contained in the first byte of prefix S, it corresponds with tag can8bit2);
- Indicator of switching main-beam headlamps (is contained in the first byte of prefix P, it corresponds with tag can8bit6 of Galileosky protocol);
- Indicator of driver’s seatbelt (is contained in the lower byte of prefix P, it corresponds with tag can8bit7).
Prefixes S and P and corresponding tags of the protocol transmit the sum of events. This sum should be deciphered in monitoring software. For example, value of prefix $S1B2F02$ is transmitted by three one-byte tags with values $1B$, $2F$, $O2$. According to Picture 15, bits define discrete events: $1B$ ($00011011$) – dynamic ignition, the key is in ignition lock, standard signaling is activated, ignition is activated; $2F$ ($00101111$) – foot brake is pressed, hood, baggage hold, driver and passenger’s doors are opened; $O2$ ($00000010$) – vehicle is opened by a standard folding key.

The Configurator allows you to set the transmission of not only data in the most common prefixes of CAN-log to the server, but also information in rarely used prefixes defined by the customers themselves, for example, prefix $XA$ data – gas pedal position, or $XB$ – engine load (Pic. 13), all in all, four additional prefixes. For this, go to the “Settings” tab -> “Digital inputs” of the Configurator and enter the description of sent prefixes, click “Apply” button. Don’t forget to mark the selected tags transmission in the “Settings” tab -> “Protocol” of the Configurator, as described above.

Connection of the CAN-log device ends with checking the correctness of data transmission to the monitoring server (Pic. 14).

**ATTENTION!** In the beginning of 2018 the manufacturer of CAN-log has introduced a new protocol. Connection of Galileosky tracking devices to CAN-log with the new protocol is described in user manual “RS485. Connecting and Setting CAN-log” which you can find in our site https://galileosky.com/podderzhka/dokumentacziya.html.
The CAN-log device connection to the Galileosky tracking device via RS232 or RS485 interfaces 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.