



USER MANUAL

fuel level sensor

DOT BLS v.6



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INTENDED USE

DOT high-precision fuel level sensors (FLS, also referred to as meters or sensors) are designed to measure the fill level of reservoirs, fuel tanks and petroleum product storage tanks. DOT is used in vehicles to monitor fuel levels and in industry to measure the level of light petroleum products. The DOT sensor uses capacitive measurement. Readings depend on the dielectric permittivity of the medium surrounding the sensor; in this case, various light petroleum products such as gasoline, diesel fuel, etc.

The sensor is not intended to measure the level of water or other electrically conductive liquids, or liquids that change their physical state within the operating temperature range.

The sensor is not intended to measure fuel levels in tanks requiring explosion-proof equipment.

Protection against electric shock: Class III in accordance with GOST 12.2.007.0-75. The product is designed to be powered by a safety extra-low-voltage DC source. It has no external or internal electrical circuits operating above safety extra-low voltage.

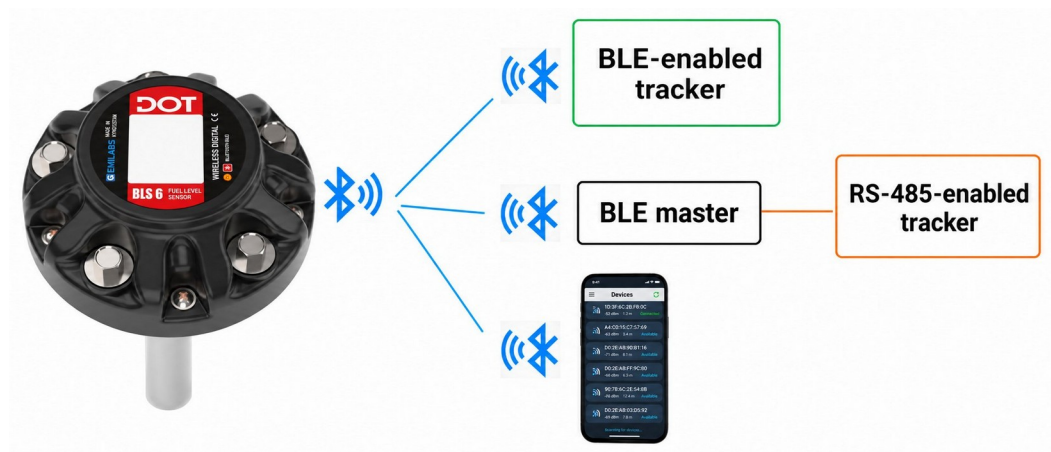
Sensor diagnostics, configuration and tank calibration are performed wirelessly via Bluetooth (BLE) using the Sensor Configurator mobile app.

Data is transmitted to third-party devices wirelessly via Bluetooth (BLE).

Store the sensor strictly horizontally. In this position, the built-in accelerometer detects an inactive state and switches off power to the main board to prevent battery discharge.

The DOT sensor head is larger than that of the previous-generation sensor (v.4); the self-tapping screw mounting positions do not match.

Connection options:



TECHNICAL SPECIFICATIONS

The main specifications of the fuel level sensor are listed in Table 1.

Table 11 — Main Technical Specifications

Parameter	Value
Supply voltage, V	3.6 (internal ER17335 battery)
Current consumption, μA	20
Service life, years	7
Replaceable battery	Yes
Security seal attachment point	Provided
Built-in temperature sensor	Provided
Built-in accelerometer	Provided
Measurement error, %	No more than 1
Operating temperature range, $^{\circ}\text{C}$	From -40 to +70
Measuring section length, mm	300 - 1000
Weight, g (1 m version)	400
Protection against electric shock in accordance with GOST 12.2.007.0–75	Class III
Firmware updates	Supported
Data transmission interface	Bluetooth 5.3 Compatible with 4.0–5.3
Range (in open space without interference or obstacles), m	10-20
Configuration and diagnostics	Mobile app Android and iOS

MOBILE APP — SENSOR CONFIGURATOR

The Sensor Configurator mobile app displays current readings, allows you to change sensor settings and perform tank calibration by incremental filling.

Procedure for working with the sensor in the app:

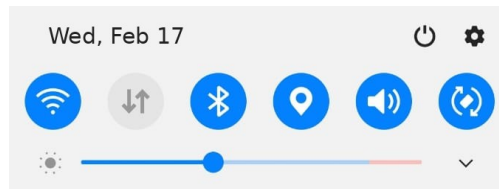
1. Download the app from the app store

The latest version is available via these links:

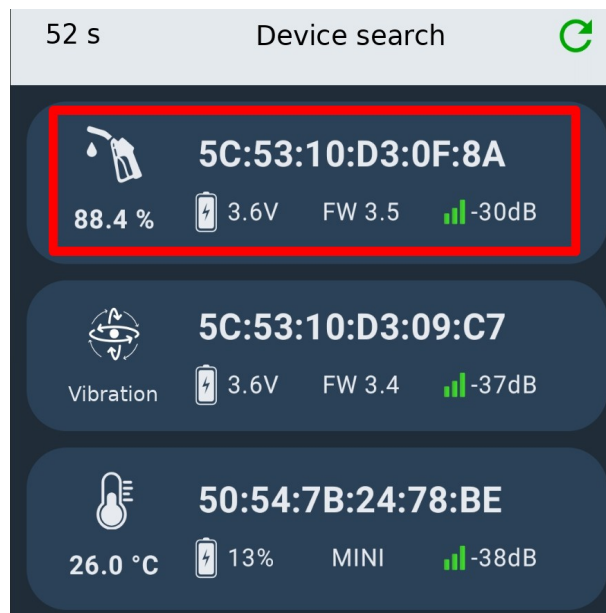
[Android](#)

[iOS](#)

2. Launch the app and follow the instructions (Bluetooth and location services must be enabled in the device settings)

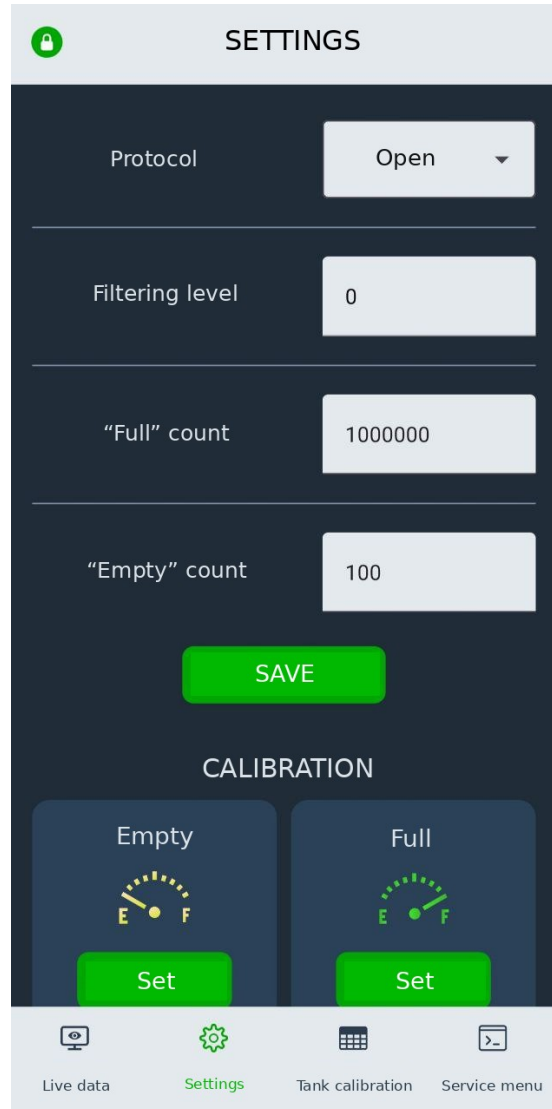
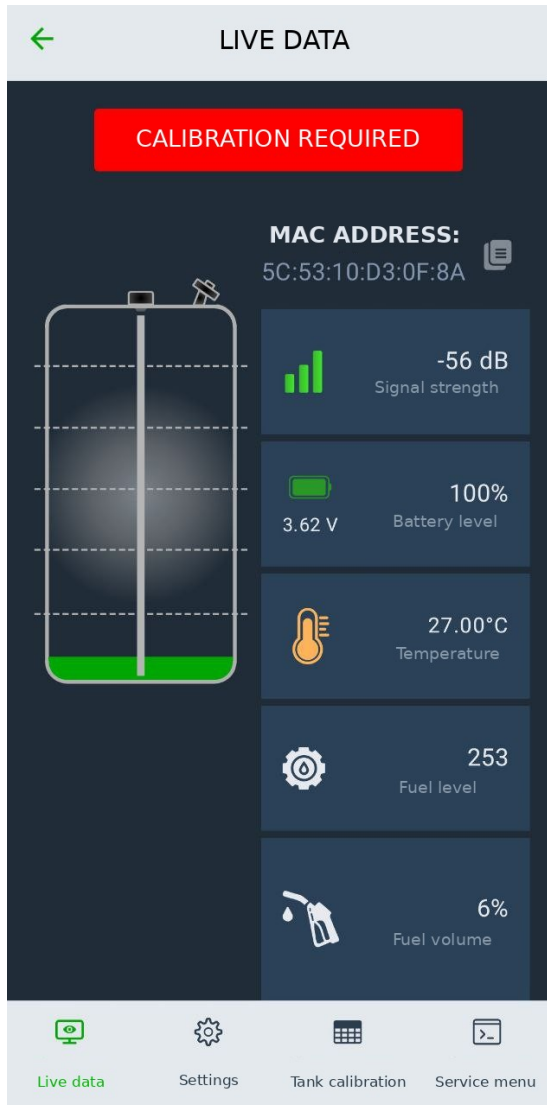


3. The app scans for nearby sensors and displays them as a list in the search window. Sensors are automatically sorted by signal strength (the strongest signal is always at the top) and identified by type icons: fuel level sensor, temperature sensor, relay, etc.



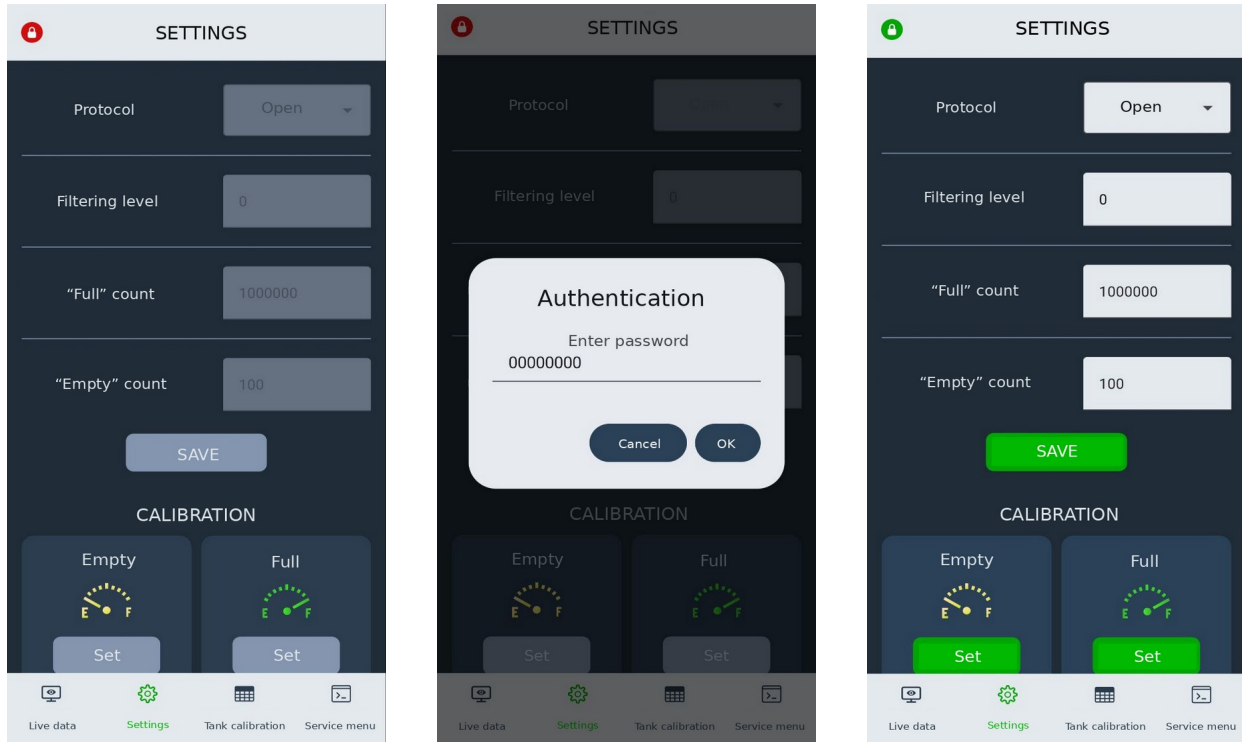
FUEL LEVEL SENSOR

4. Select the sensor you want to work with by tapping it in the list of available sensors.



FUEL LEVEL SENSOR

5. On first launch, the app automatically reads the fuel level sensor settings and displays them in the corresponding sections. After authentication, you can change the settings to suit the installation. To authenticate, tap the lock icon in the top-left corner of the app.



***The default password is “00000000”.
It can be changed in the service menu.***

FUEL LEVEL SENSOR

6. The following settings are available:

- **Transmission channel**

In the “Protocol” field, select the Bluetooth wireless data transmission mode:

- “Open” — sensor data (level, temperature and battery voltage) is sent in **advertising** (broadcast) packets (see the protocol below). This mode is suitable for use with trackers.
- “Closed” — data is encrypted and transmitted when connected via BLE Master. This mode is not suitable for use with trackers.

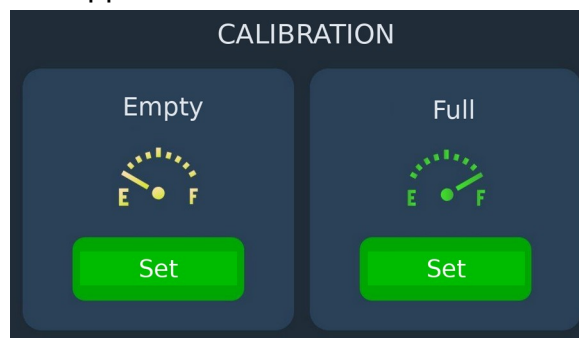
- **Filtering depth (range: 0 to 20)**

Set the output signal filtering parameters in the “Filtering depth” field. Available options:

- “0” — filtering is performed automatically.
- “1–19” — filtering for vehicles operating under normal road conditions (scheduled passenger transport and freight transport).
- “20” — maximum filtering for vehicles operating under difficult road conditions (construction machinery, off-road vehicles and agricultural machinery).

- **“Empty” and “Full” counters**

The “FULL” and “EMPTY” counter values are recorded during calibration using the corresponding buttons in the app.



For experienced users and fast replacement of a fuel level sensor, manual entry of the “FULL” and “EMPTY” counters is available.

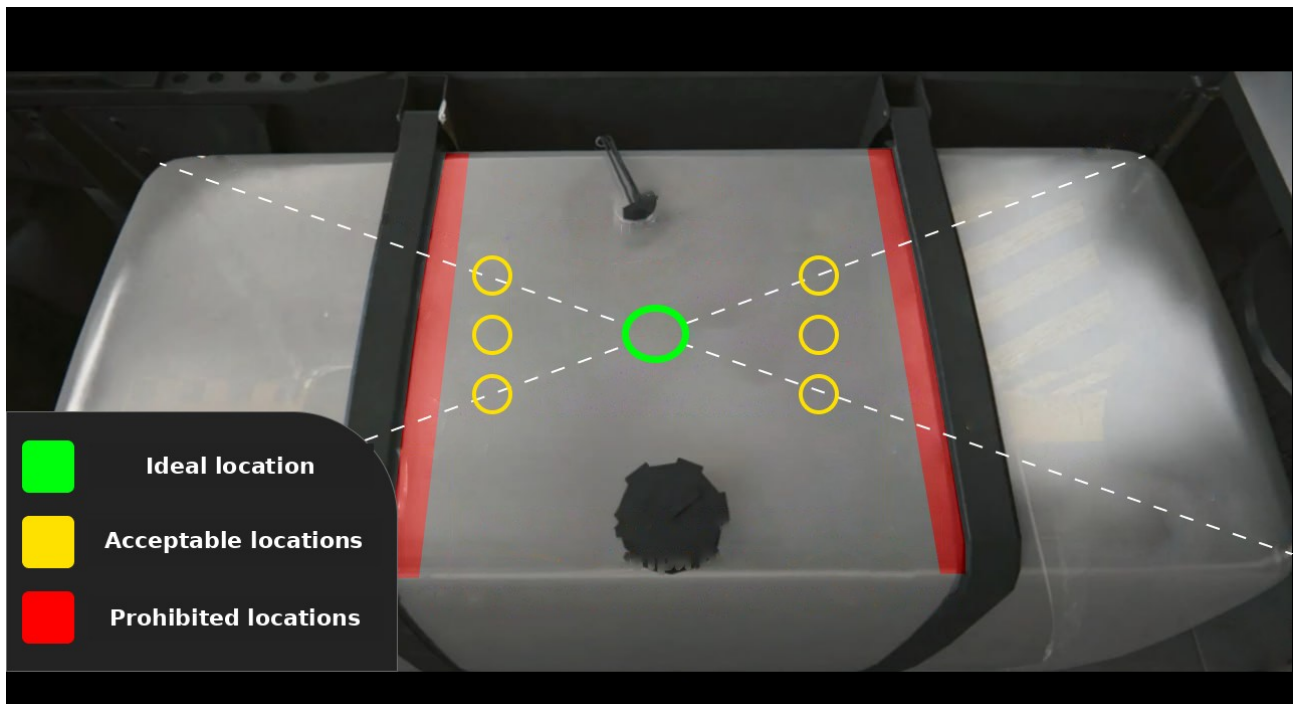
PREPARING THE TANK FOR INSTALLATION

Before installation:

1. Completely drain the fuel tank and dry it if necessary
2. Check the overall dimensions of the sensor head in the supplied drawing (see “DOT Mounting Drawing”)

Choosing an installation location:

- The preferred position is the geometric center of the tank
- Alternative position (if the center is inaccessible):
- As close to the center as possible
- At the point where the tank is tallest
- Avoid installing close to internal tank baffles



Suitable sensor installation location

Installation procedure:

1. Marking:

- Mark the center of the future hole using a Ø3 mm drill bit

2. Drilling the main hole:

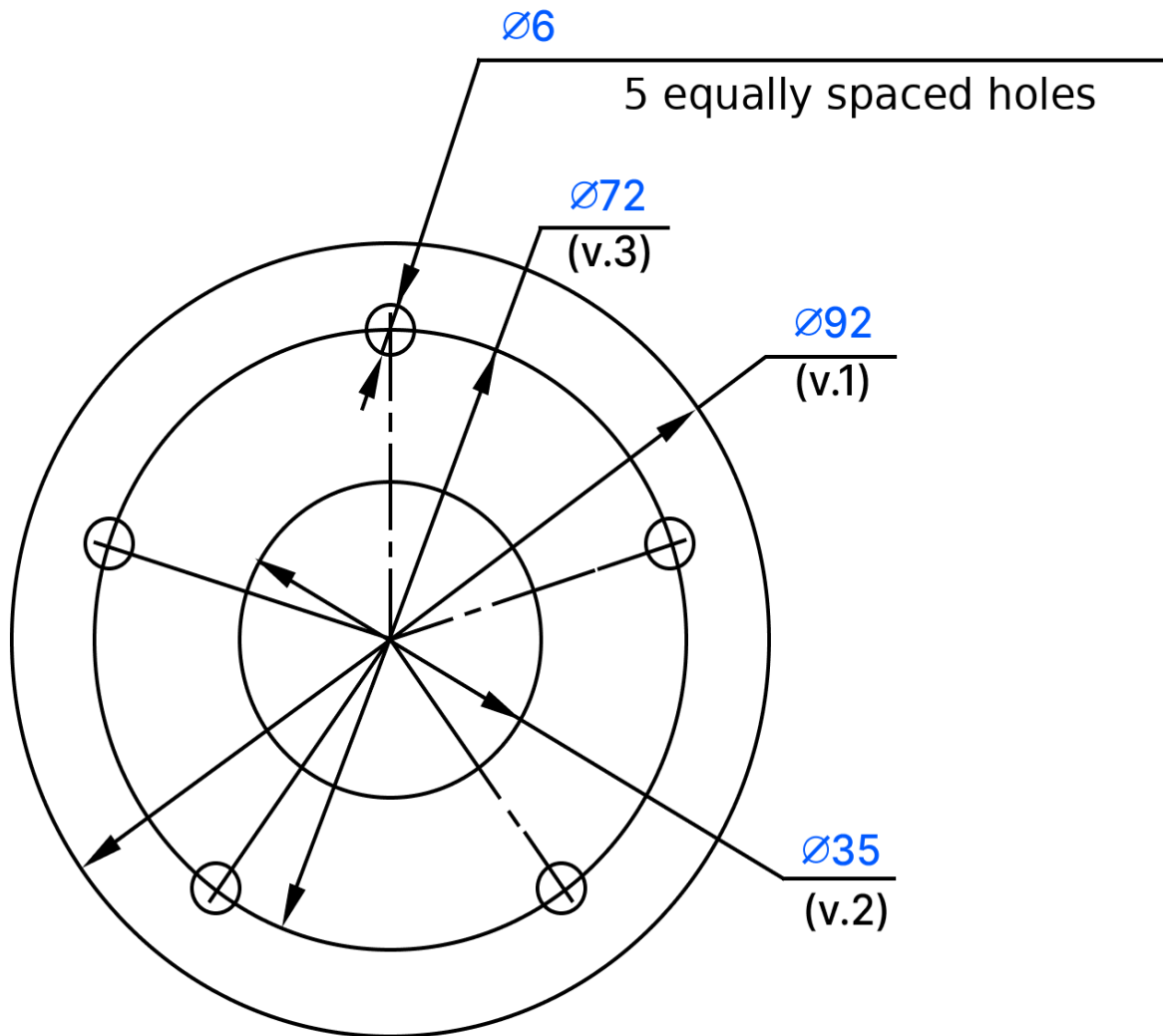
- Use a Ø35 mm bimetal hole saw
- Hold the tool at an angle of 10–15° to prevent the cut-out disc from falling into the tank

3. Precautions:

- Use a magnet to collect metal shavings
- Keep the work area clean

-
- **Do not install the sensor where fuel is strongly agitated while the vehicle is moving**
 - **Avoid areas where contaminants may accumulate**
 - **Check that the mounting hole matches the flange dimensions in the drawing**
-

DOT MOUNTING DRAWING



PREPARING THE SENSOR FOR INSTALLATION

1. Determining the Measuring Tube Length

Before calibrating the sensor, determine the measuring tube length according to the height of the fuel tank.

- The tube must be 15 mm shorter than the **tank** height to avoid:
 - ◆ contact with the tank bottom (dirt, water or deposits);
 - ◆ tube deformation caused by pressure from the tank bottom.

Tube length calculation:

$L = H - 15 \text{ mm}$, where:

- **L** — final tube length after cutting;
- **H** — tank height at the sensor installation point.

Important!

*The sensor must not be shorter than **300 mm (30 cm)** after cutting.*

2. Cutting the Tubes

- Use a **hacksaw**.
- When cutting, take care to:
 - ◆ avoid damaging the connection between the tubes and the board inside the sensor housing;
 - ◆ prevent metal shavings from entering the tubes.

3. Cleaning and Finishing the Tubes

- If shavings enter the tubes, blow them **out with compressed air** through the drainage holes under the sensor flange.
- Sand the cut edges **to remove** burrs and irregularities.

SENSOR CALIBRATION

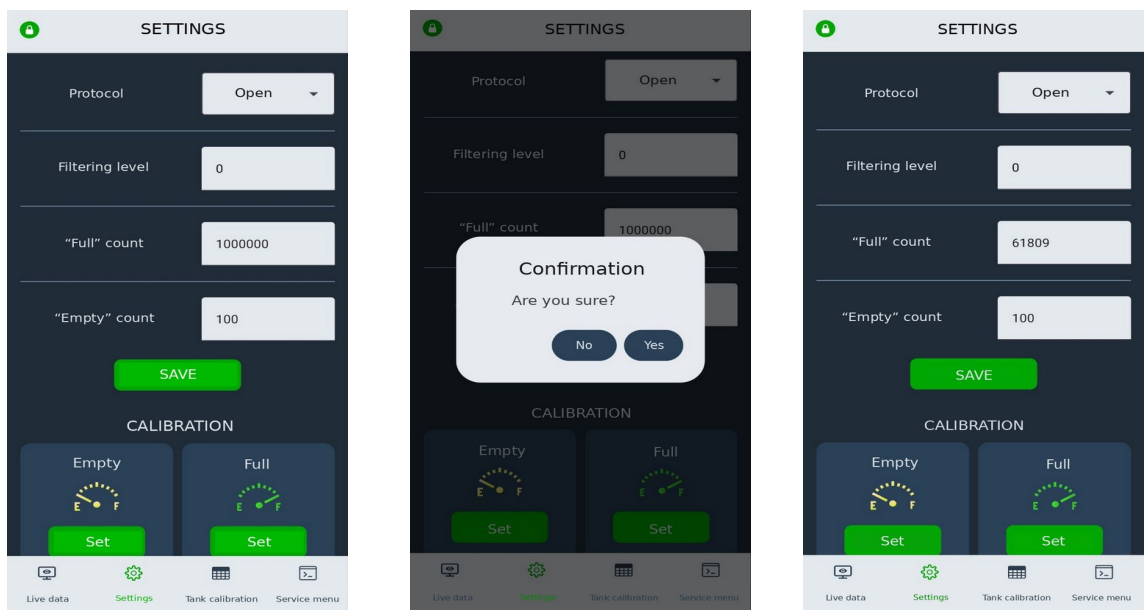
After cutting the sensor to suit the tank height, calibrate it by setting the upper and lower level measurement limits.

Calibration with Fuel

Calibrate the sensor using the same fuel it will measure in service. A section of plumbing pipe ($\varnothing \geq 40$ mm), sealed at one end, is recommended as a calibration vessel. Perform calibration by immersing the sensor in the liquid.

To calibrate the fuel level sensor manually:

1. Lower the fuel level sensor into the measuring vessel. Fill the vessel with fuel so that the entire measuring section is immersed. Wait at least 1 minute, then press “FULL”.



2. Remove the sensor from the vessel and allow the fuel to drain for 1 minute, then press “EMPTY”.

Calibration without Fuel (Automatic Calibration)

Sensor requirements for automatic calibration:

- Cut the sensor according to the instructions (see “Preparing the Sensor for Installation”)
- The sensor housing and measuring tube must be completely dry
- Make sure there are no metal shavings or other contaminants inside the measuring tube.

Automatic calibration procedure:

1. Authenticate in the mobile app
2. Open Sensor Settings
3. Tap “Calibrate without fuel” at the bottom of the screen



4. Do not allow the measuring tubes to touch other objects during the process
5. After 5–10 seconds, the “Empty” and “Full” counter values will update automatically

If any errors occurred during calibration, repeat the procedure for setting the upper and lower level measurement limits.

For experienced users and fast replacement of a fuel level sensor, manual entry of the “FULL” and “EMPTY” counters is available.

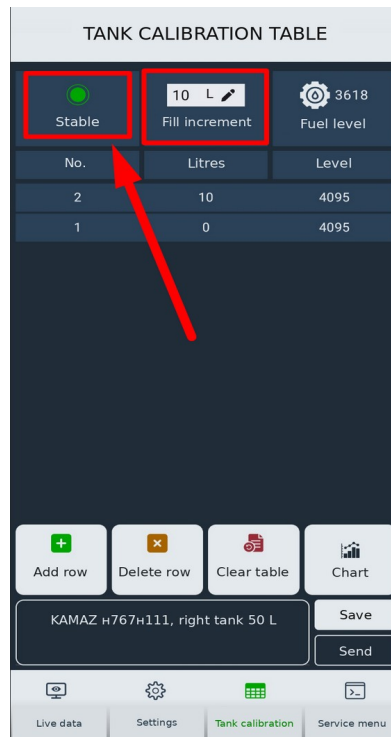
To calibrate using manual entry, enter the empty and full values in the corresponding fields and press “WRITE”.

TANK CALIBRATION

The “Calibration table” section lets you create a tank calibration table and save it electronically.

Set the measurement (filling) increment in liters before starting tank calibration.

It is recommended to set “Filtering depth” to “0” during tank calibration and restore the required setting afterwards.



Do not add a new row while readings are stabilizing — the indicator is red

Then fill the tank in measured increments.

Tap “+ Add row” to add the next row to the calibration table.

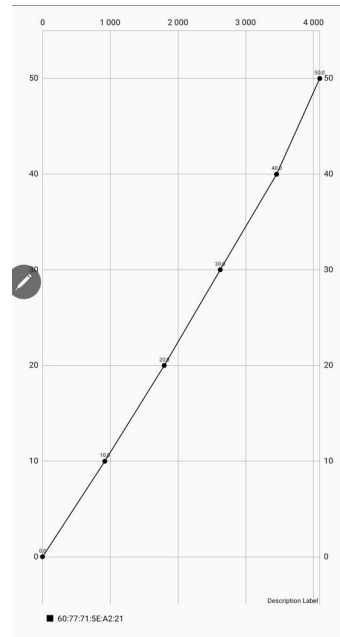
If you make a mistake, select the row and tap “- Remove row”.

To delete all data from the table, tap “Clear table” and confirm by tapping “Yes”.

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You can display the calibration table as a graph at any time by selecting “Graph”.
You can add installation information in the “Comment” field.

TANK CALIBRATION TABLE		
	10 L	4095
Stable	Fill increment	Fuel level
No.	Litres	Level
8	70	4095
7	60	4095
6	50	4094
5	40	3457
4	30	2623
3	20	1797
2	10	919
1	0	0
KAMAZ H767H111, right tank 50 L		
Add row	Delete row	Clear table
Save		Send
Live data	Settings	Tank calibration



After completing incremental filling, save the calibration table as a file on the device by selecting “Save”, or send it to a recipient by selecting “Send”.

The file contains all installation data, for example:

MAC address: 5C:53:10:D3:0F:8A
Date: 25-06-2025 13:07
Temperature: 27.00°C
Battery voltage: 3.61 V
Sensor firmware version: 3.5
App software version: 1.3.0(build 1739197948)-release
Filtering depth: 0
"Empty" counter: 100
"Full" counter: 61809
Comment: KAMAZ n767n111, right tank 50 L

Level	Liters
0	0
919	10
1797	20
2623	30
3457	40
4094	50
4095	60

After finishing work with the fuel level sensor in the app, return to the device selection screen or close the app and remove it from memory.

BATTERY REPLACEMENT

Requirements before replacement:

- Use only an ER17335 battery (3.6 V)
- Before installation, depassivate the battery according to the battery manufacturer's instructions to prevent:
 - ◆ false low-battery indications
 - ◆ repeated sensor restarts caused by insufficient voltage
- You can order a replacement kit from our sales representative. We recommend using our installation kit to replace the fuel level sensor battery. We accept no liability for improper operation with batteries of unsuitable specifications or used batteries. Only new batteries may be used in the sensor.

Replacement procedure:

1. Removing the cover

- Remove the security seal
- Unscrew the fastening bolts (replace bolts with damaged threads)

2. Removing the old battery

- Note the battery orientation (polarity: "+" terminals are covered with heat-shrink tubing)
- Carefully remove the protective coating with a nonconductive tool until the terminals are accessible
- If the polarity is not visible, remove the coating until the board markings are exposed

3. Installing the new battery

- Remove the old battery from the terminals
- Degrease the contacts (isopropyl alcohol / white spirit)
- Install the new battery **with the correct polarity**

FUEL LEVEL SENSOR

4. Checking and Reassembly

- Check that the mobile app can communicate with the sensor
- Apply a new layer of protective coating
- Replace the rubber seal on the housing
- Align the security seal holes
- Tighten the **screws in a crisscross pattern**, as shown below
- Fit a new security seal

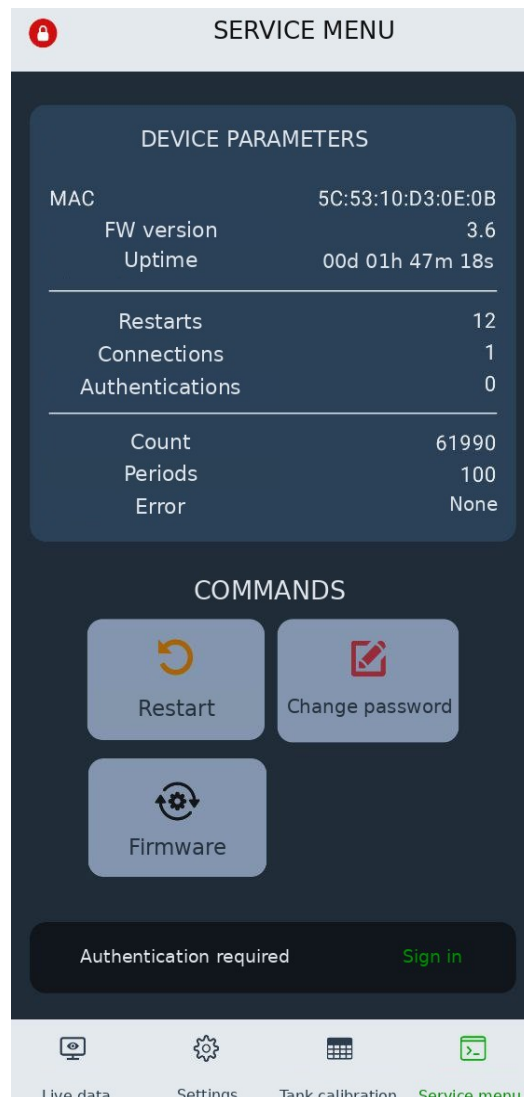


UPDATING THE SENSOR FIRMWARE

To update the fuel level sensor firmware, you need a firmware file with the *.hex extension.

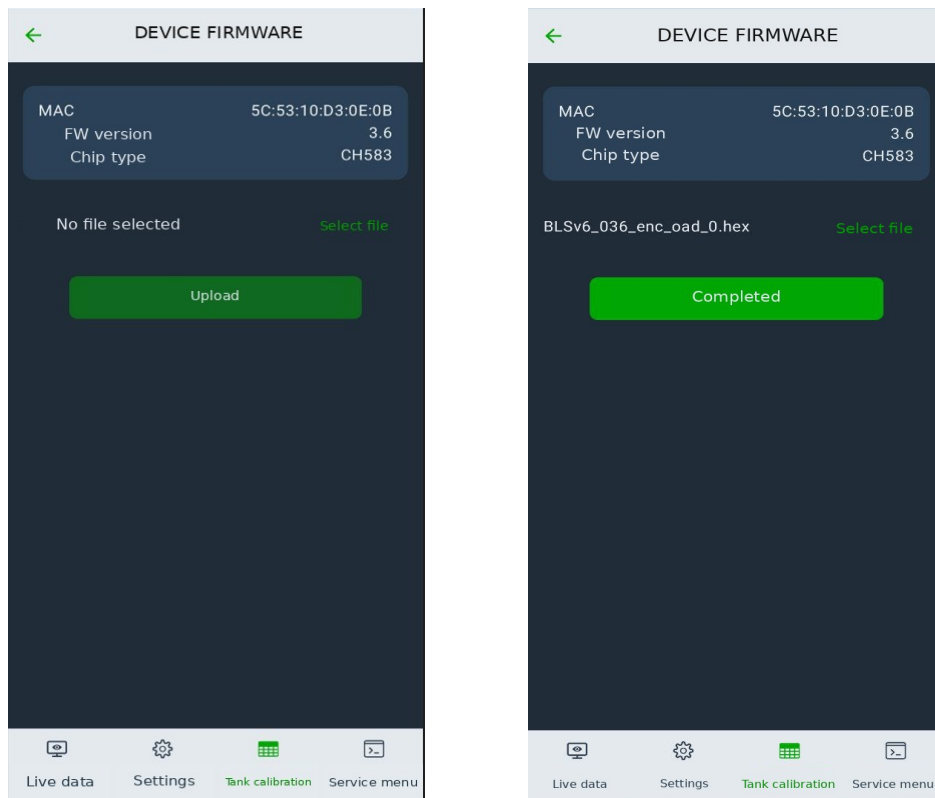
To update the sensor firmware:

1. Select “Firmware” in the “Service menu”.

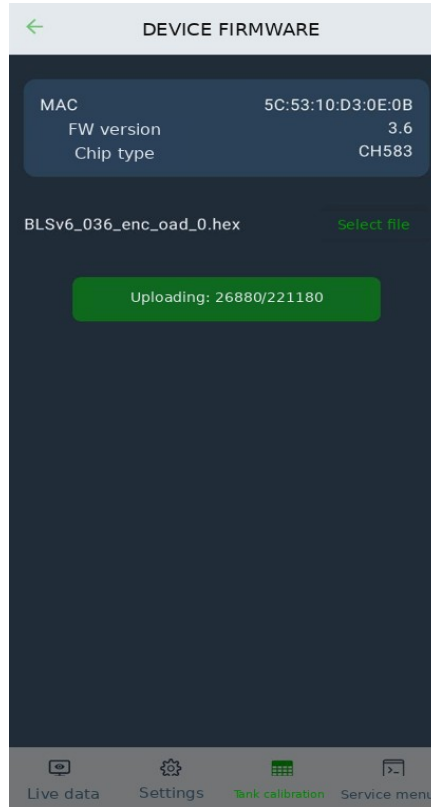


FUEL LEVEL SENSOR

2. The sensor enters update preparation mode, then prompts you to select a firmware file.

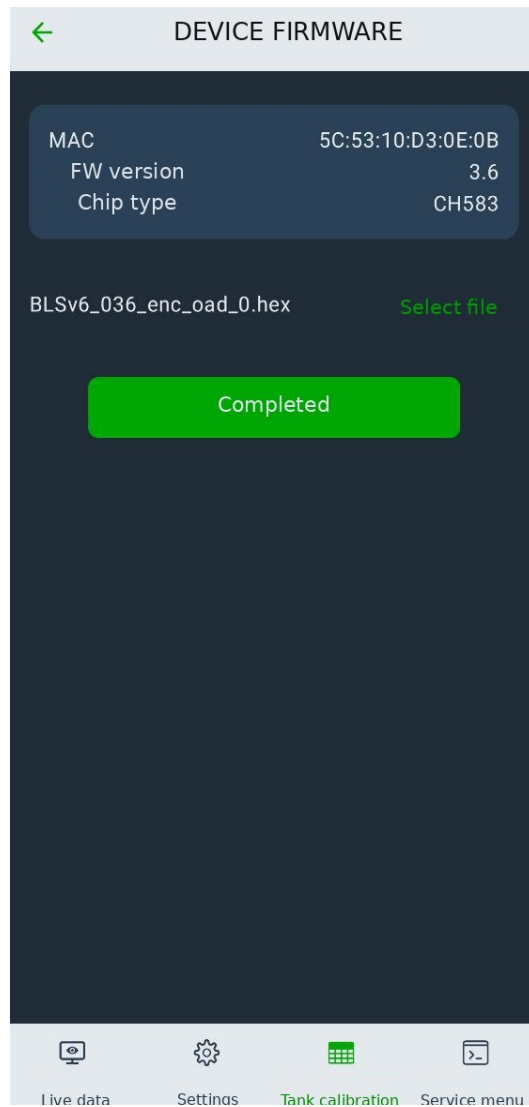


3. Select the firmware file and tap “Open” to start the update.



4. When the firmware update is complete, the message “Update complete, device restarting” appears. Tap “OK”.

FUEL LEVEL SENSOR



BLUETOOTH (BLE) COMMUNICATION PROTOCOL

The sensor broadcasts advertising packets at regular intervals (2 seconds).

Example sensor packet (components are highlighted in different colors):

0FFF160F010E002112100B69000080000A0954445F354541323231

These packets contain two types of data:

- Manufacturer data — sensor parameters (level, temperature, etc.)

0FFF - type 0xFF = “Manufacturer data”, length = 0x0F

160F010E002112100B6900008000 — payload transmitted by the sensor

Offset, bytes	Field size, bytes	Value	Description
0	2	0x160F	Prefix (manufacturer code)
+2	1	01h	Sensor type — fuel level sensor
+3	2	0000h...FFFFh	Relative level 000Eh = 14
+5	1	00h...FFh	Battery voltage 21h = 3.3 V (the transmitted value is multiplied by 10)
+6	1	-128...127	Temperature in degrees Celsius 12h = 16 degrees
+7	1	00h...FFh	Sensor firmware version 10h = 016
+8	4	00000000h... FFFFFFFFh	Raw data counter 0000690Bh = 26891
+12	1	00h, 80h	Measurement range 00h = 0 ... 1024 80h = 0 ... 4095
+13	1	00h...14h	Filtering depth 00h = 0 (from 0 to 20)

- Complete local name — sensor name

0A09 - type 0x09 = “Complete local name”, length = 0x0A

54445F354541323231 — data (TD_5EA221)

SENSOR ERROR CODES

The DOT fuel level sensor reports faults through the temperature readings in the monitoring system.

How does it work?

- During normal operation, the sensor transmits the actual fuel temperature.
- If an error occurs, a fault code is transmitted instead of the temperature.

Where are errors displayed?

Error codes can be viewed:

- In **monitoring** system reports (Locavist, Wialon, etc.)
- In **the vehicle's** current data (in the temperature field)
- In **notifications**, if alerts are configured in the system

Table 2— Error Codes

Temperature value (level)	Error code in app	Fault description
- 125 (7000)	1	Measuring tube short circuit / water in tank
- 126 (6500)	2	Sensor measuring section faulty
- 127	3	Battery discharged (replacement required)
- 128	4	Temperature sensor and motion sensor faulty

WARRANTY

The equipment is designed for a long service life in autonomous, maintenance-free operation.

The date of initial installation and the installer's details must be entered on the warranty card and certified with the installer's stamp.

THE PRODUCT IS NOT ELIGIBLE FOR WARRANTY REPAIR / REPLACEMENT IN THE FOLLOWING CASES:

- failure to comply with the product operating instructions;
- mechanical damage (external or internal);
- the measuring rod is pushed upwards by the tank bottom because the sensor was cut incorrectly (left too long);
- faults caused by foreign objects, insects or liquids entering the equipment;
- chemical, electrochemical, electrostatic or extreme thermal damage;
- damage caused by power supply, communication or cable networks that do not comply with national standards;
- damage caused by installing components that do not meet the manufacturer's technical requirements;
- repairs or preventive maintenance during the warranty period performed by persons not authorized by the manufacturer;
- damage to the manufacturer's seals on the equipment;
- equipment malfunctions resulting from external influences on the equipment or the electrical circuit to which it is connected;
- faults caused by third-party actions or other unforeseen circumstances unrelated to the equipment manufacturer's obligations.

PACKAGE CONTENTS

The DOT sensor **package contents** are listed in Table 3.

Table 3 Package Contents

N o.	Item	Qty	Note
1	Fuel level sensor	1	
2	Rubber gasket	1	
3	Self-tapping screws for mounting the fuel level sensor	5	
4	Packaging	1	
5	Product passport	1*	On request

The latest technical information and software are available on the relevant page of the manufacturer's website.

Note: The manufacturer reserves the right to change the package contents without reducing the product's performance or functionality.