

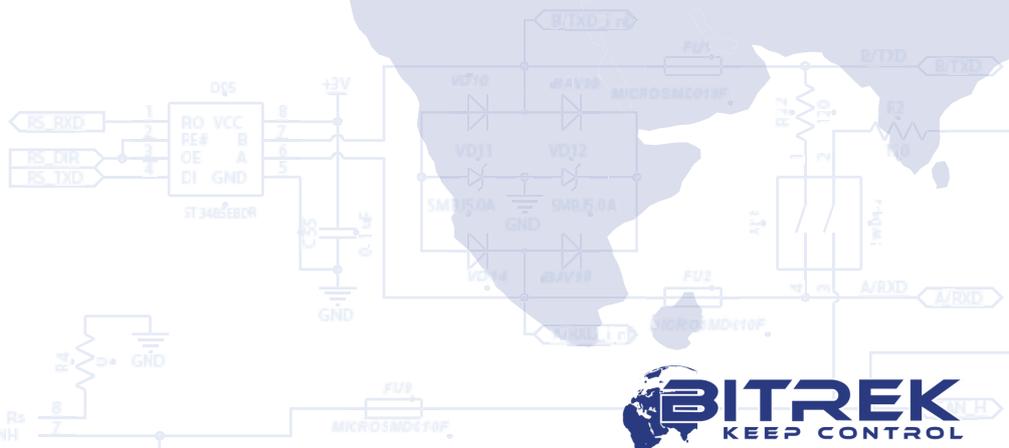
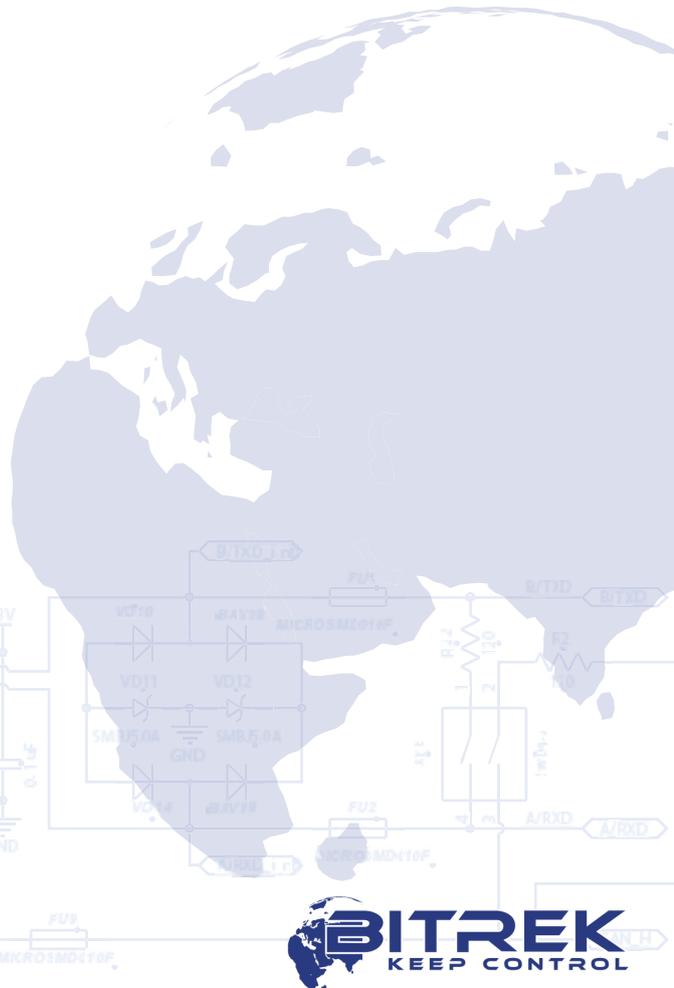
# Operating manual

## BI FL Sensor Configurator version 2.2.0



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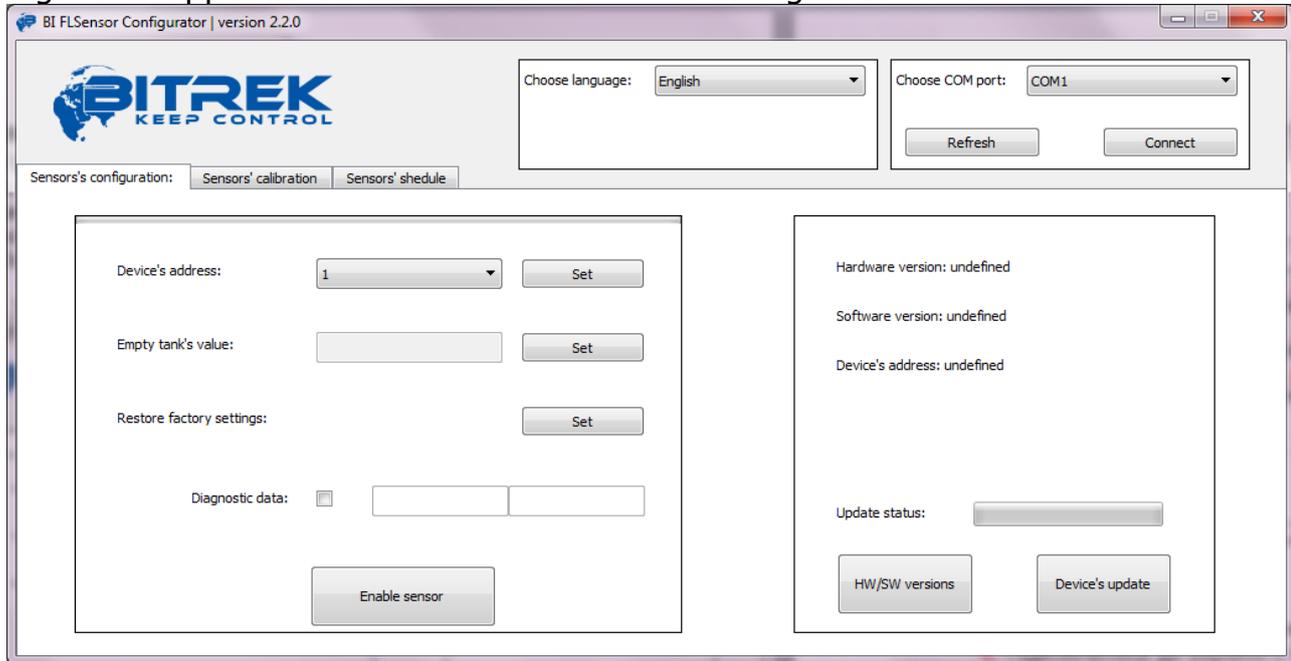


## Purpose

BI FLSensor Configurator software is designed to work exclusively with BI FLSensor V5 fuel level sensors. This software allows you to calibrate two connected sensors at the same time.

The appearance of the configurator window is shown in Fig. 1.

Figure 1. Appearance of BI FLSensor 2.2.0 configurator



## Overview of the main configurator tabs

The configurator workspace is divided into 3 main tabs:

- Sensor's configuration
- Sensor's calibration
- Sensor's schedule

The functionality of each tab will be described separately.

## Sensor's configuration tab

This tab shows the basic setup of the connected fuel level sensor. Send commands from this tab are allowed for one connected sensor only.

Fig. 2 shows the appearance and designation of the functional elements.

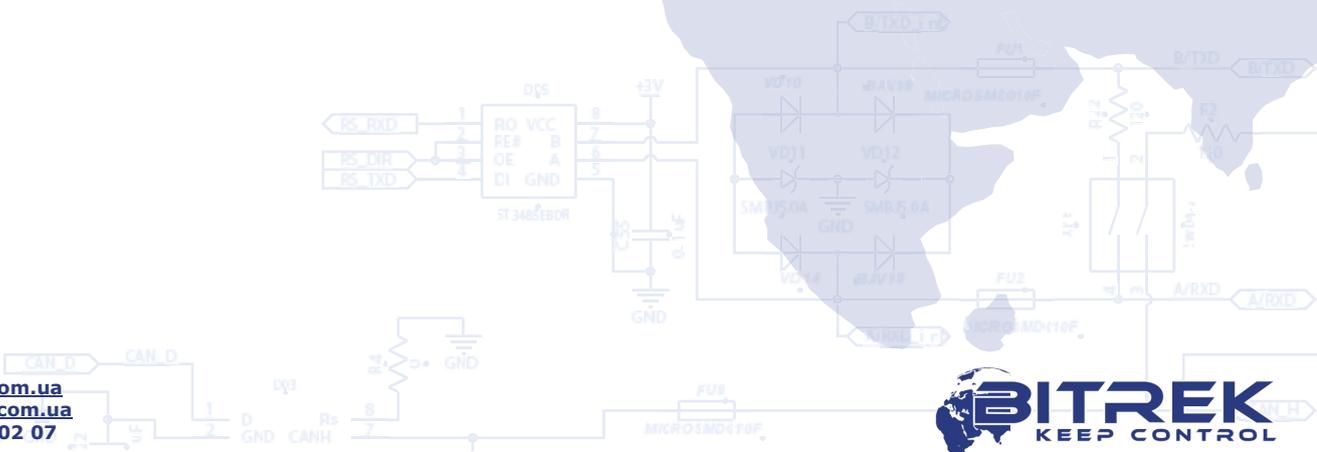
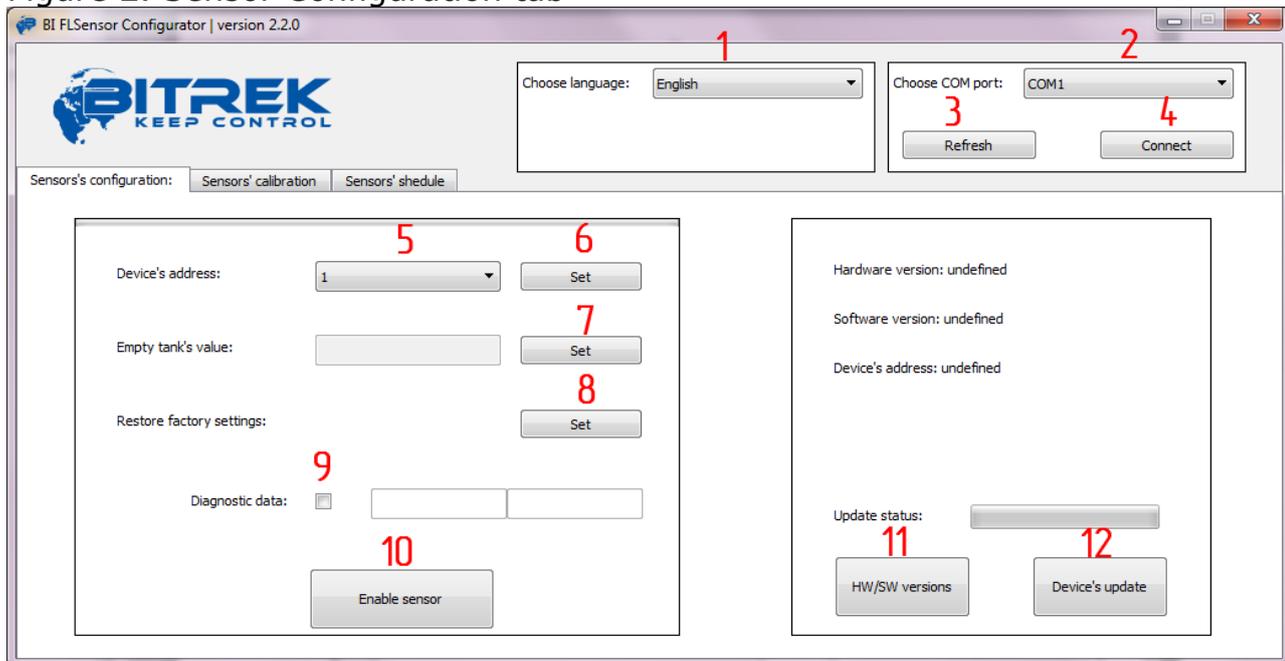


Figure 2. Sensor Configuration tab



1. Choose interface language;
2. Select COM port number;
3. Refresh the list of available COM ports;
4. Connect to the selected COM port;
5. Select the network address number for the sensor;
6. Set the network address;
7. Set an empty tank value in automatic mode (autocalibration);
8. Restore factory settings of the sensor;
9. Activate the sensor diagnostic data;
10. Enable poll of connected sensor;
11. Request a device version and software version of the connected sensor;
12. Update the sensor's software.

Note that sending any commands from this tab is not allowed if two sensors are connected at the same time. Any settings and commands must be sent to only one connected sensor.

If the sensor is successfully connected, the status bar will be highlighted in green (Fig. 3). The color of the status bar will change to red if the sensor cannot be connected.

The Diagnostic Data option does not carry useful information to the user and is not used when working with the sensor.

Figure 3. Status bar of the connected sensor

Device's address:

Empty tank's value:

Restore factory settings:

Diagnostic data:

## Sensor's calibration tab

Working with the fuel level sensors in calibration process of the fuel tank is performed on this tab.

The appearance and designation of the functional elements is presented in Fig. 4.

Figure 4. Sensor's calibration tab

BITREK KEEP CONTROL

Choose language:  Choose COM port:

Sensors' configuration | **Sensors' calibration** | Sensors' schedule

Device's address:

Temperature:

Calibrated data: (data for tracker)

Filtered data:

Fill ():

Stabilization positions:

Maximum deviation:

Sensor's period of survey:

	Litres	Level
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		

Device's address:

Temperature:

Calibrated data: (data for tracker)

Filtered data:

Fill ():

Stabilization positions:

Maximum deviation:

Sensor's period of survey:

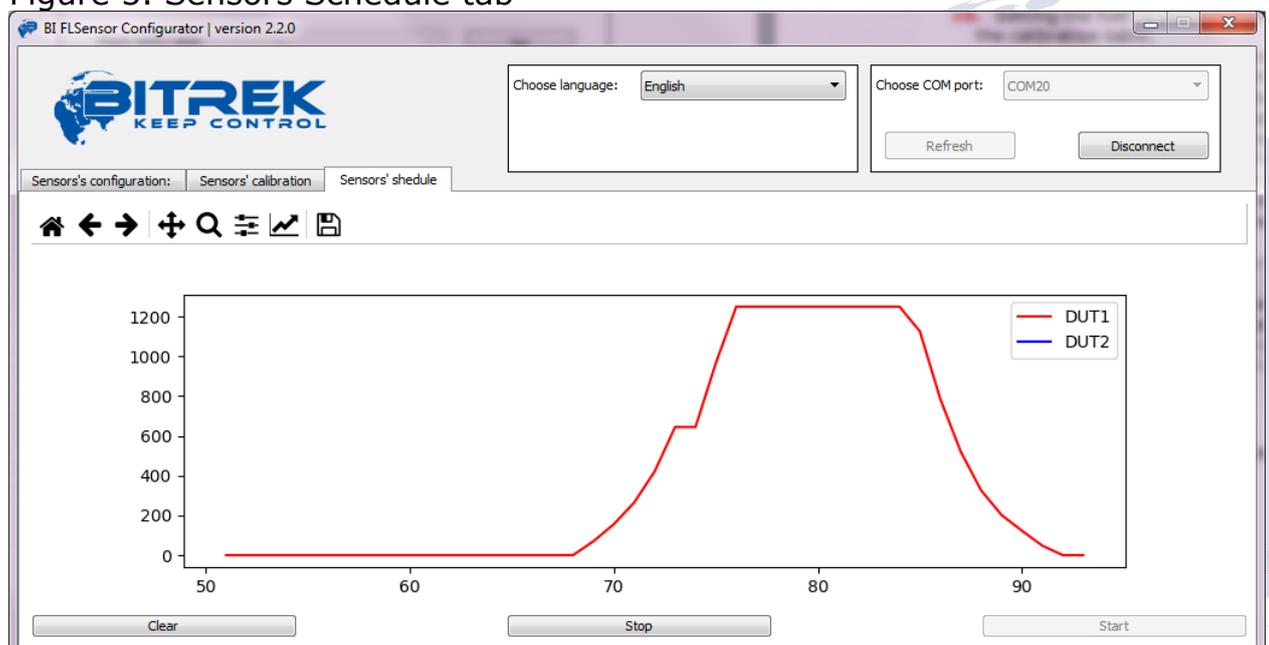
13. Selecting the network address of the connected sensor;
14. Polling activation;
15. Sensor temperature;
16. Current sensor data (in liters or N-code);
17. Filtered sensor data (N-code);
18. Setting the fuel fill portion during calibration and adding a row to the calibration table;
19. Number of fuel stabilization positions. It will not be possible to add a row to the spreadsheet until the number of stabilized positions has reached the set value;
20. Deviation of values for stabilization of fuel level. It will not be possible to add a row to the spreadsheet until the deviation of values for stabilization reaches the set value;
21. Sensor polling period (in seconds);
22. Remove stored spreadsheet from sensor memory;
23. Save the calibration table in the memory of the sensor or in a file;
24. Read the spreadsheet from the sensor memory or from a file.

BI FLSensor Configurator software allows two different sensors to be calibrated at the same time. The Sensor Calibration tab is divided into two zones - for each sensor connected separately. The status of the sensor connection is visually displayed using the status bar.

## Sensor's schedule tab

This tab (Fig. 5) shows the real time graphs of the level of the connected sensors.

Figure 5. Sensors Schedule tab



Press the "Start" button to display the graph.

## Calibration of the fuel level sensor

Unlike previous versions of fuel level sensors, V5 version calibration is performed automatically. To set the empty tank value, please follow these steps:

1. Cut the probe to the required length;
2. Install the cap on the probe;
3. Connect the sensor to the configurator;
4. Locate the sensor in the upright position and without touching the probe measuring part and not immersing it in the measured liquid, press button [Z](#) on the Sensor Configuration tab.

## Using BI FLSensor Configurator Software

### Sensor connection and its basic configuration

To get started with the fuel level sensor you must connect it to a PC using a special BI FL Sensor programmer. It is not necessary to supply power to the sensor because the power connectors are built into the programmer socket.

Start "FL Sensor Configurator" software, select the required COM port that corresponds to the programmer connected to the PC and connect to it by clicking the Connect button located in the panel. In order to continue working with the connected sensor, it is necessary to activate its poll by pressing the corresponding button [10](#) "Enable sensor". The status bar will be highlighted in green if the connection is successful.

After the connection to the sensor is established, it must be assigned a network address on the RS-485 bus and calibrate the sensor as specified in the section "[Calibration of the fuel level sensor](#)". This is where the basic sensor settings are complete and you can go through the calibration process.

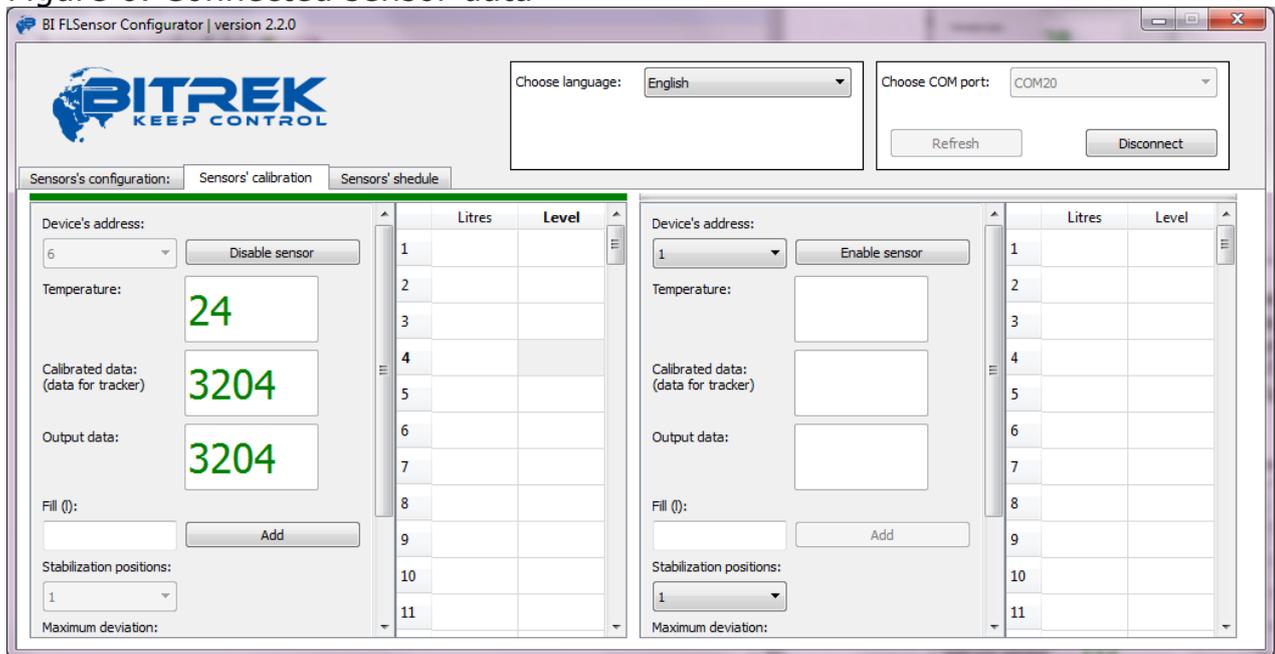
### Sensor calibration

The BI FL Sensor Configurator software allows you to calibrate two connected sensors at the same time if it necessary. The calibration process has remained unchanged, but the V5 sensors have changed logic of fuel level measurement and added the ability to record/read the calibration table in/from the sensor memory.

All further actions related to the calibration process are performed on the Sensor Calibration tab.

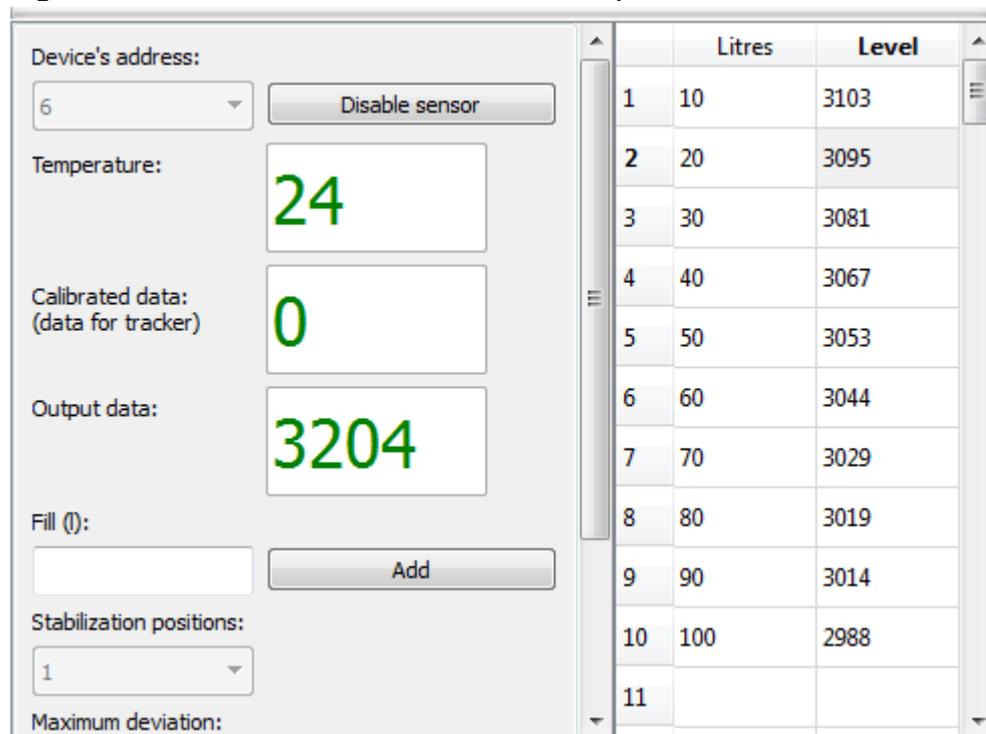
First of all, on the Sensor Calibration tab, you must select the network address that corresponds to the sensor settings and enable the poll with the button [14](#) "Enable sensor". The status bar will be highlighted in green and the relevant fields of the program will be filled with relevant information (Fig. 6).

Figure 6. Connected sensor data



Note that the values of the fields "Calibrated data (data for tracker)" and "Output data" will be equal to each other if the calibration table is not saved to the sensor's memory. Otherwise, the field "Calibrated data (data for tracker)" will transfer the value in liters according to the spreadsheet which is stored in the memory of the sensor (Fig. 7).

Figure 7. Sensor data with recorded spreadsheet



The operating sensor values will be in the range between zero and the level that will be automatically set after the sensor has been calibrated. In this case, a value close to zero will correspond to a full tank.

### For example:

After calibration is complete, the sensor value is set to 723. The upper sensor value becomes 8232 and the tank is empty. During the calibration process and the gradual filling of the tank, this value will go to zero. Thus, the operating range of values will be in the range close to "0" (full) - "8232" (empty). The value of the full tank may vary depending on the geometry of the tank and will be in a range from "1000" to "0".

It should also be noted that the V5 sensors do not have the ability to set the filtering level. Filter settings are included in the sensor firmware.

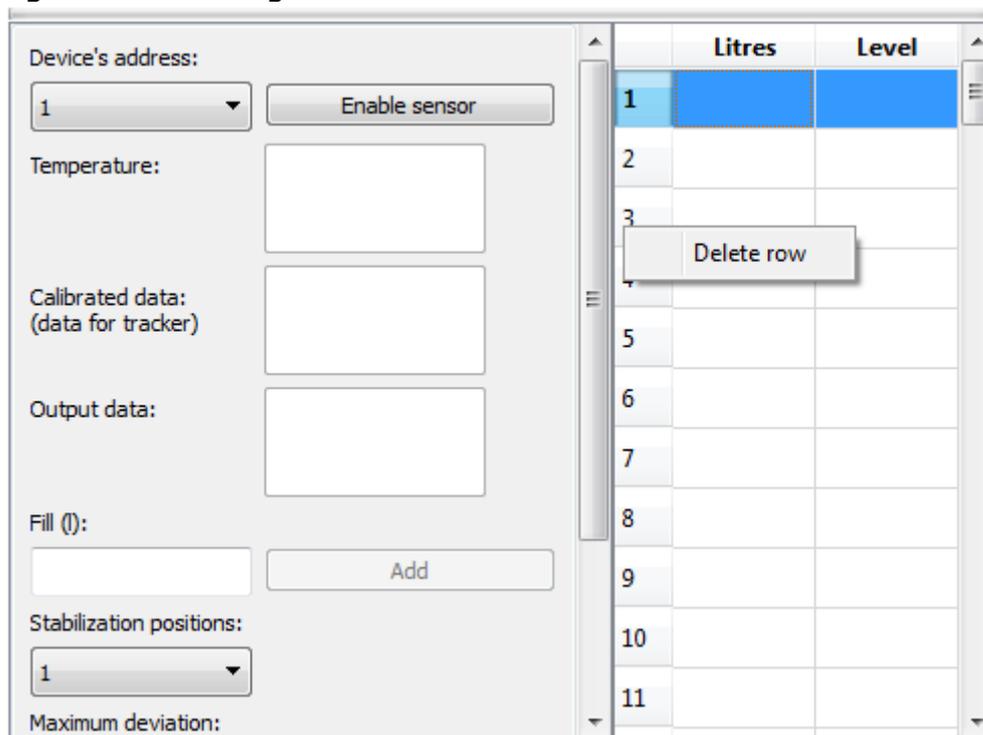
To create a calibration table (spreadsheet), specify the amount of fuel that has been filled into the tank in the "Fill" box, wait for the value to stabilize and press the "Add" button. The row with Liters/Level will be added to the table to the right. Keep in mind that in the calibration process, sensor values are constantly changing, and for convenience, readout parameters can be used, which can only be adjusted when sensor polling is off.

The table can be stored individually in a file or uploaded to the sensor memory after the calibration is complete.

Note that each time the "Add" button is clicked, the spreadsheet is saved to a local disk in a separate BITREK\_DUT folder, which is created in the root directory with the installed configurator. This option has been added in case of emergency shutdown of the computer or in case of unexpected errors during calibration. However, saving the spreadsheet to a file manually is a priority action.

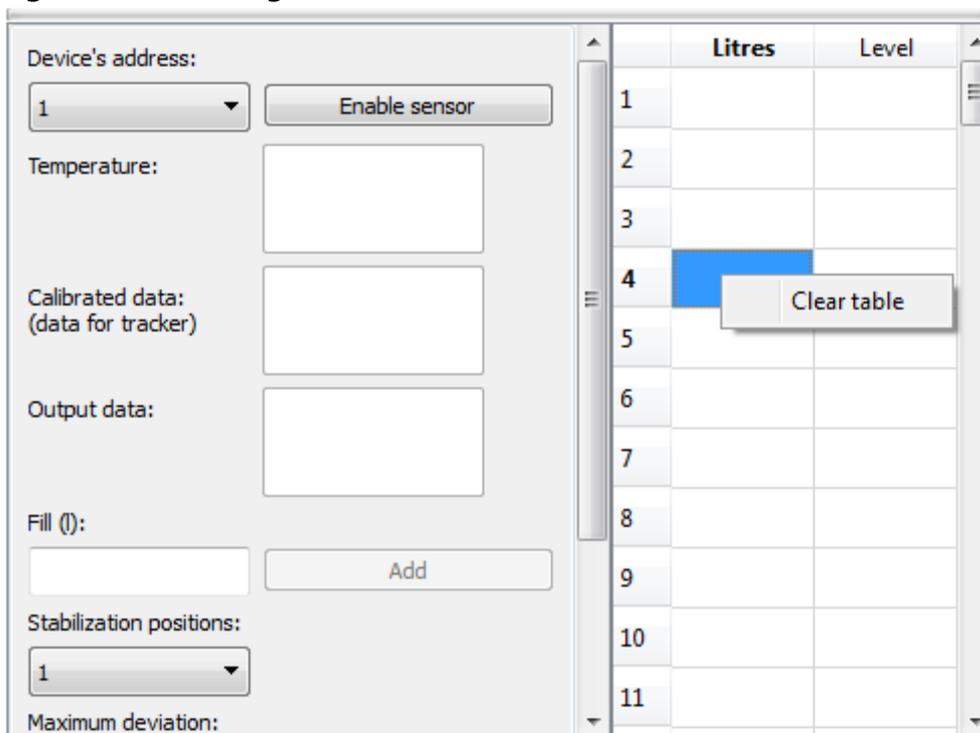
If you need to delete one of the rows of the spreadsheet, right-click on the row number and delete it (Fig.8).

Figure 8. Deleting a row



To clear an entire table, right-click on any cell in the table and delete it (Fig. 9).

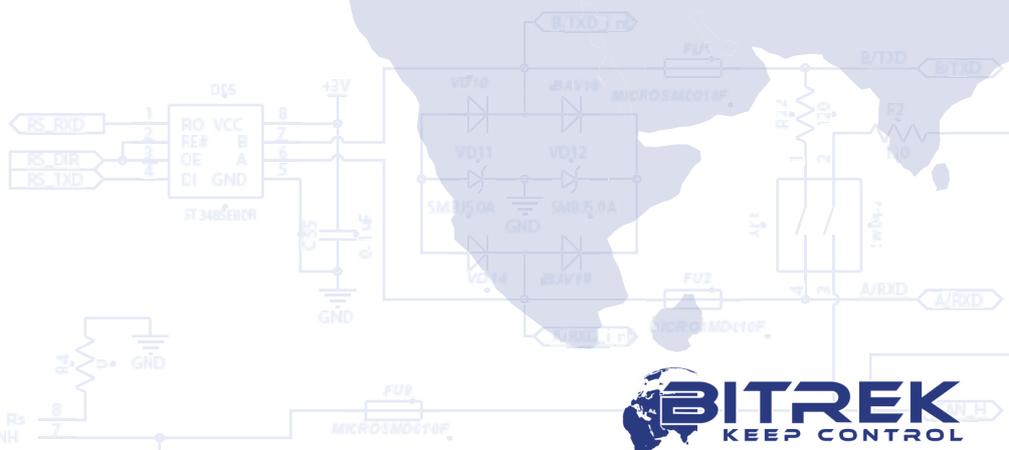
Figure 9. Clearing a calibration table



Note that clearing the table in this way does not delete the stored spreadsheet from the sensor memory. Use the "Clear Memory" option to clear the sensor memory.

To download an existing spreadsheet from a .xls file, click "Read Data" and select "From File".

Don't forget to save the calibration table in the file or in the memory of the sensor by pressing the button [23](#), after the calibration is complete.



Document version:

Date	Version	Note
26.11.2019	2019.11.1	Basic document

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