



# **System display**

**MIELTA**

DS-1502-01(02)

## **Configurator program**

### **User manual**

Software version 1.2.12

Last redaction 02/25/2016

## Table of content

1. Description .....	3
2. Program installation on user's computer.....	4
3. Display driver installation.....	7
4. Interface of the program .....	9
5. Information pages setting .....	11
6. Fuel tanks .....	12
6.1 Work with calibration tables.....	15
7. Gas station mode .....	17
8. Work with iButton keys .....	18
8.1 Redactor of iButton keys base .....	20
9. Configuring of display system parameters.....	26
10. Import and export of display system parameters .....	28
11. Display software update .....	29
12. Information about the configurator program version .....	31
Annex 1 .....	32

### 1. Description

The Configurator program (or simply "configurator" or "program") is intended to configure settings for the satellite terminal MIELTA, and perform a number of service functions. The program supports 32-bit and 64-bit editions of the operating systems Windows 2000/XP/Vista/7/8/ 8.1/10. Work with the program requires a monitor resolution of at least 800x600 pixels (1024x768 or higher is recommended), keyboard, mouse.

## 2. Program installation on user's computer

Start the execution of the installer program by double clicking on the installer file. This opens the installation wizard:

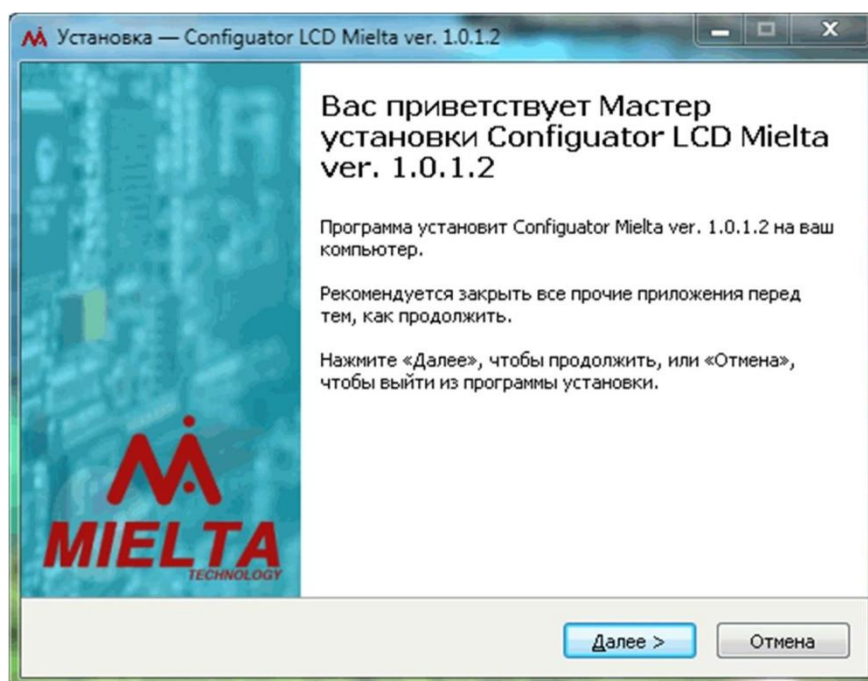


Figure 1. Installation wizard: welcome page.

Click "Next". If necessary, use the "Browse" button to change the directory in which it is installed.

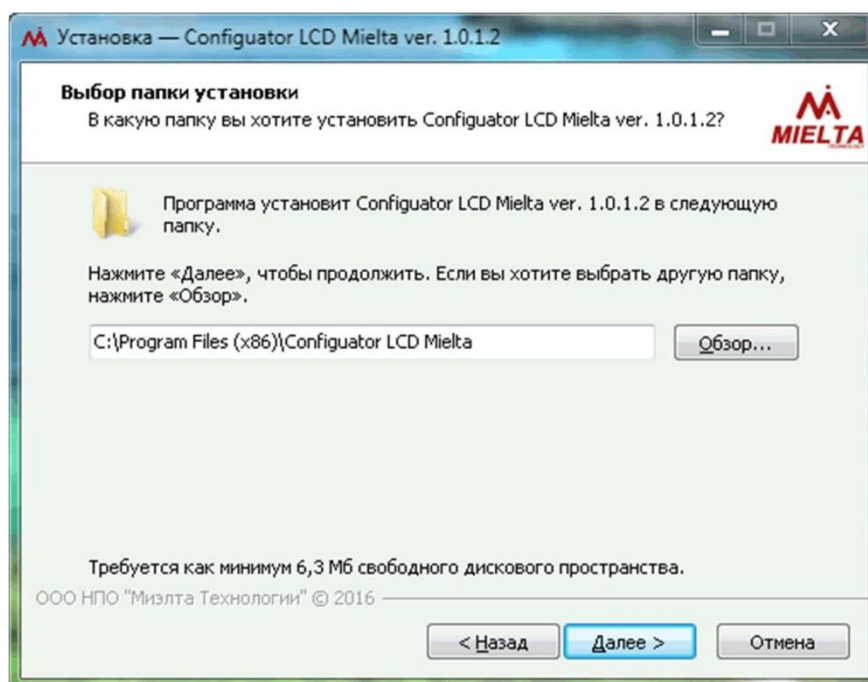


Figure 2. The setup wizard window: select the installation folder.

Click "Next". The installation wizard prompts you to create a program group in the "Start" menu; this group will contain icons to run and uninstall the program and also to install the driver terminal. If program group and shortcuts creation is not required, select

the checkbox "Do not create a folder in the "Start" menu".

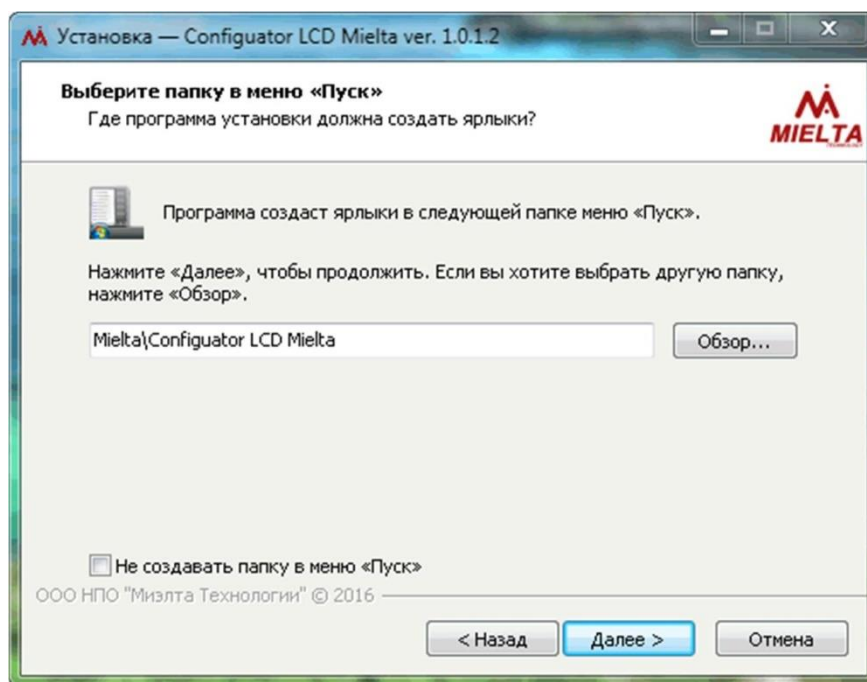


Figure 3. Setup wizard: icons creating in the start menu.

Click "Next". On the next page of the installation wizard you can choose would you like to create icon to run the program from your desktop.

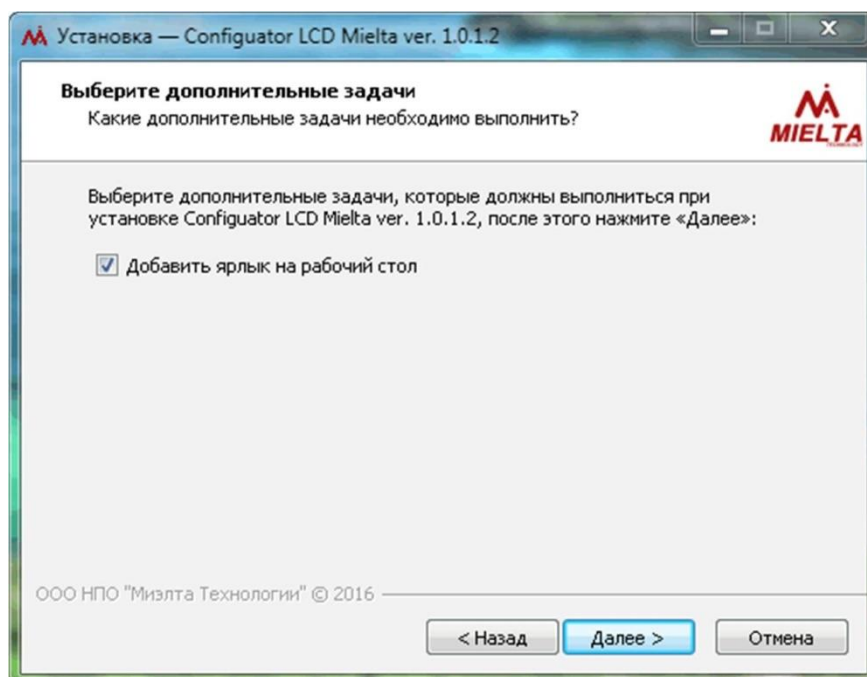


Figure 4. The installation wizard: create desktop shortcut.

Click "Next". In the new window you can check all the installation settings you specified earlier. If these settings are correct, click "Install". If some of the parameters you want to modify, click "Back" to return to settings.

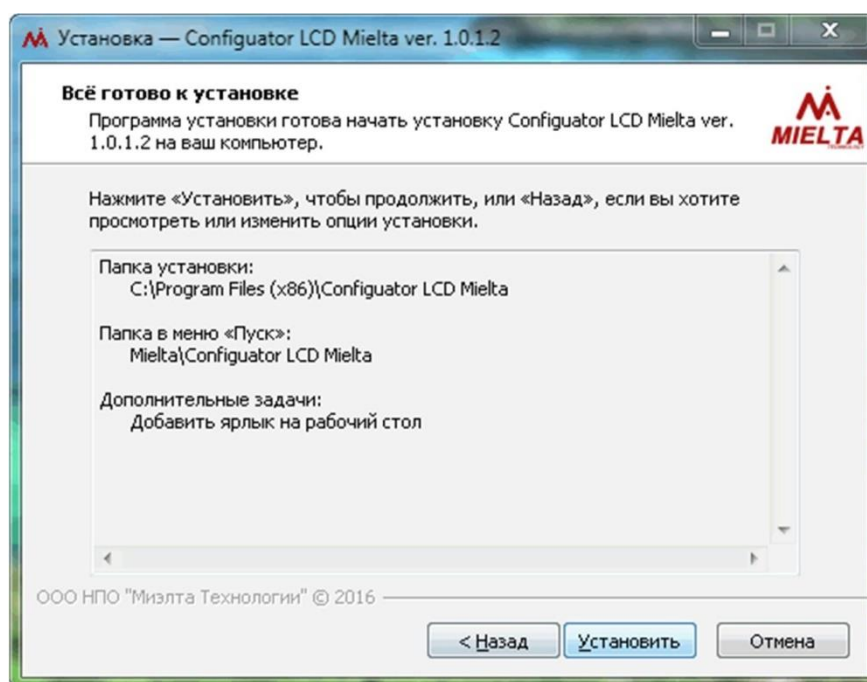


Figure 5. Setup wizard: display options setup.

After installation is complete, you have the option to start the configurator program and start the installation of terminal drivers. Select the actions you need and click "Finish".

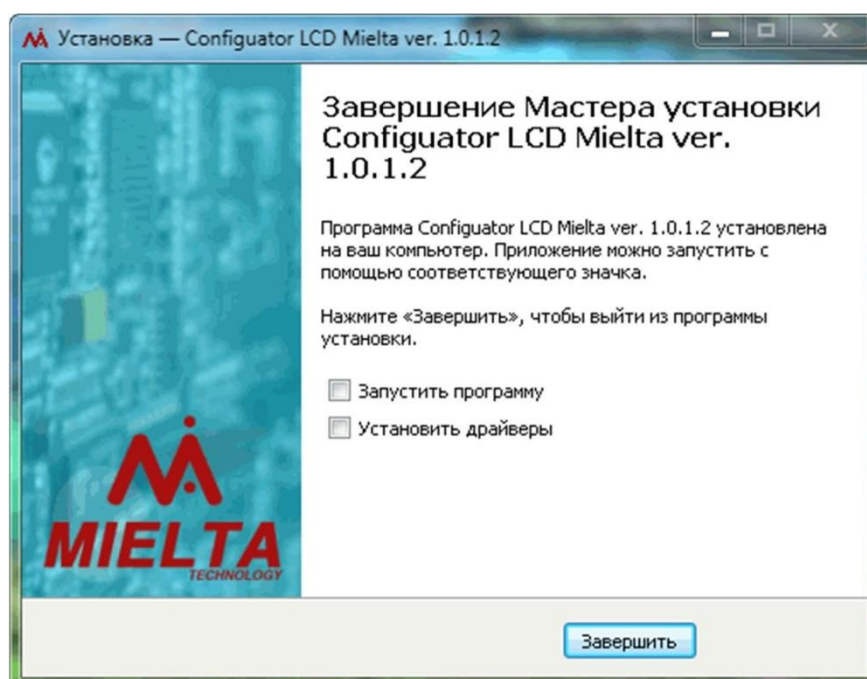


Figure 6. Installation wizard: installation complete

### 3. Terminal driver installing

For proper operation of the configurator program you must install the USB driver of satellite terminal. The driver installation is possible in two ways: using the installer of configurator program or from the menu "Start" (if the configurator has already been installed).

To install the driver using the installer, check the corresponding item in the installation complete window (see section "Program installation on user's computer").

If the configuration program is already installed, then install the driver of the terminal from the menu of "Start" button. In the program group "Mielta Configurator" click the icon "Install driver".

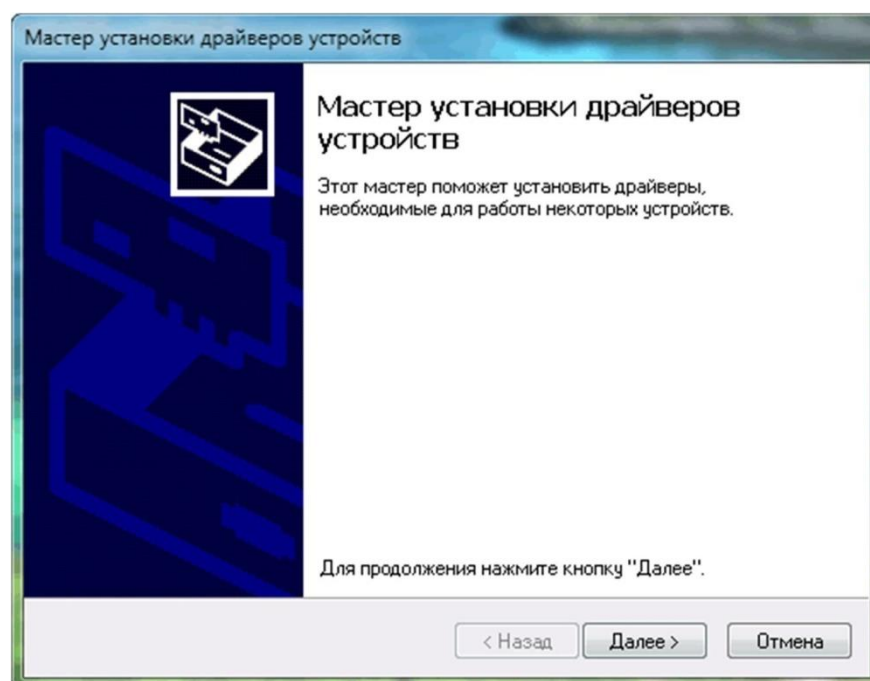


Figure 7. Driver installation wizard: welcome screen.

Click "Next". The operating system will install drivers.

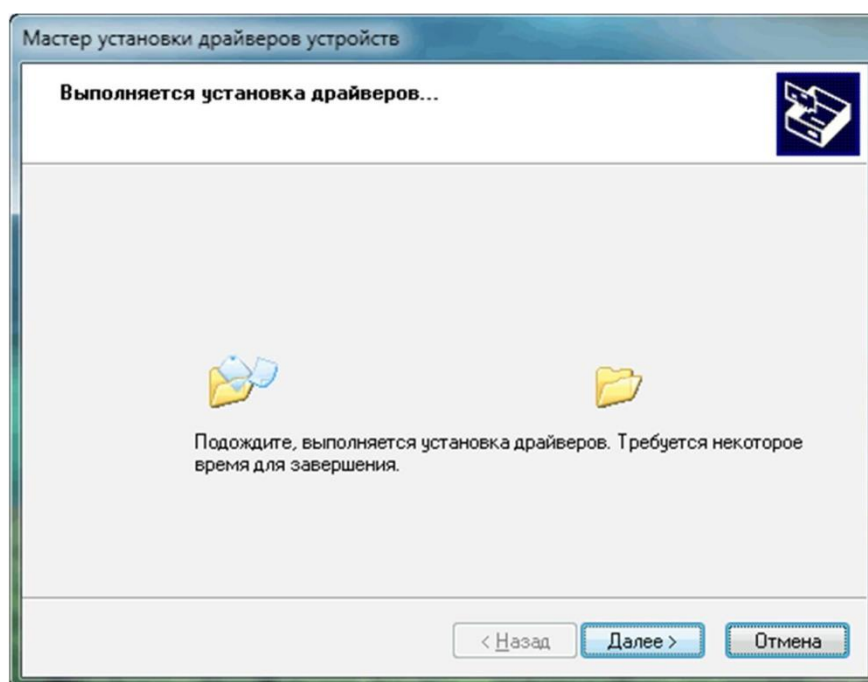


Figure 8. Driver installation wizard: the installation process.

After the installation is complete, you will see a window with the results.

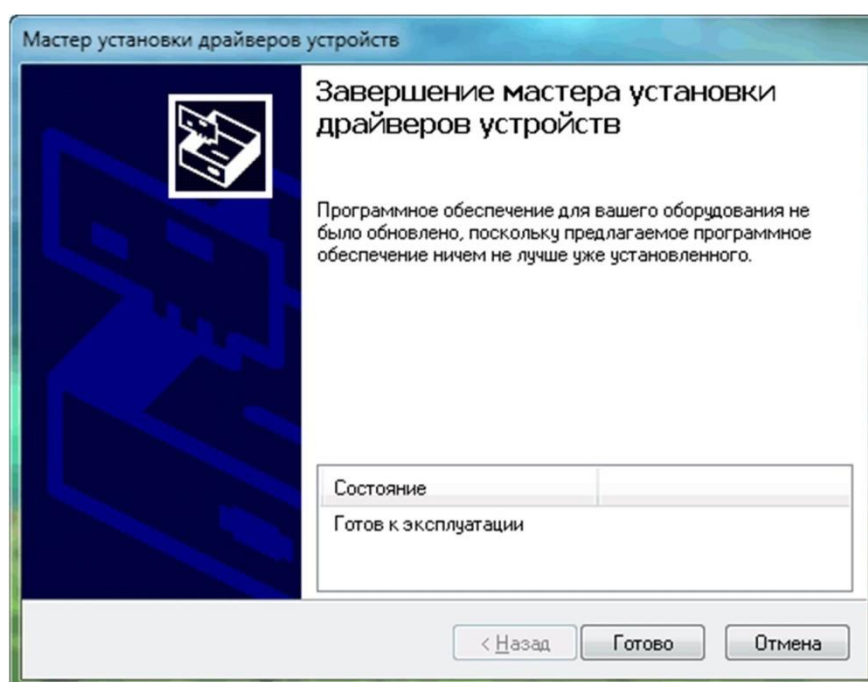


Figure 9. Driver installation wizard: installation complete.










## 4. Interface of the program

Configurator program window is presented below.



Figure 10. Configurator program window.

In the left part of the window is the main menu that provides access to the following functionality:

 <b>Страницы</b>	Enable/disable information pages, displayed data selection
 <b>Бак 1</b>	Fuel tank No. 1: setting of the fuel level sensors for tank, work with calibration tables
 <b>Бак 2</b>	Fuel tank No. 2: setting of the fuel level sensors for tank, work with calibration tables
 <b>АЗС</b>	Enable/disable gas station mode and display settings in this mode
 <b>iButton</b>	Setting of iButton keys operation mode, edit the database of keys stored in the display
 <b>Параметры</b>	Display system settings (date, time, network address, brightness, contrast, etc.)
 <b>Сервис</b>	Service functions: export and import of parameters, display software update

At the bottom of the window is a status line, which displays the activity of data exchange between the program and the terminal, and displays various messages and prompts:

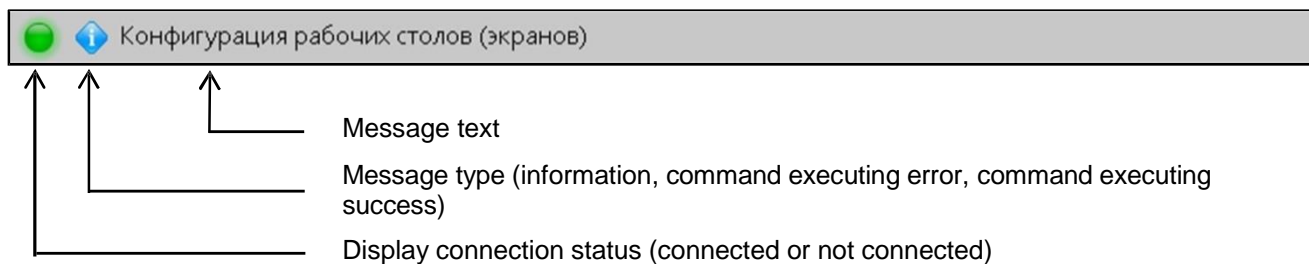


Figure 11. Configurator: status bar

## 5. Information pages settings

Enable/disable of information pages and the selection of data displayed can be conducted in the menu "Pages":

Конфигурация информационных страниц			
Страница 1	Вкл	Дата и время	
Страница 2	Вкл	Статус терминала	
Страница 3	Вкл	Напряжение бортсети	СД: слот RS485 - 1
Страница 4	Вкл	АЗС: Текущ.заправка	АЗС: Суточный объем
Страница 5	Выкл	Аналоговый вход AIN1	Дискретный вход FIN1
Страница 6	Выкл	СД: слот RS232 - 1	СД: слот 1-Wire - 1

Figure 12. Configurator: information pages settings.

To enable or disable information pages please click in the appropriate cell of the table, setting will be changed to the opposite. Disabled page is not displayed on the display when you switch pages. If you disable all informational pages, the display will show the page № 1 (date and time).

To customize the data displayed on the information pages № 3-6, please click in the appropriate cell of the table (left column is for the configuration data by the first row, right column – by the second row). This opens a window for data selection:

Страница 3 - Данные по строке 1

☐ Аналоговый вход AIN1  
☐ Аналоговый вход AIN2  
☐ Аналоговый вход AIN3  
☐ Аналоговый вход AIN4  
☐ Дискретный вход FIN1  
☐ Дискретный вход FIN2  
☒ Напряжение бортсети  
☐ Температура (встроен)  
☐ Акселерометр (встроен)  
☐ Статус аккумулятора  
☐ СД: слот RS232-1

☐ СД: слот RS485-1  
☐ СД: слот RS485-2  
☐ СД: слот RS485-3  
☐ СД: слот RS485-4  
☐ СД: слот RS485-5  
☐ СД: слот RS485-6  
☐ СД: слот RS485-7  
☐ СД: слот RS485-8  
☐ АЗС: Общий объем  
☐ АЗС: Суточный объем  
☐ АЗС: Текущ.заправка

☐ Слот 1-Wire - 1  
☐ Слот 1-Wire - 2  
☐ Слот 1-Wire - 3  
☐ Слот 1-Wire - 4  
☐ Слот 1-Wire - 5  
☐ Слот 1-Wire - 6  
☐ Слот 1-Wire - 7  
☐ Слот 1-Wire - 8  
☐ Измер.: Бак 1  
☐ Измер.: Бак 2  
☐ Измер.: Бак1 + Бак2

Отменить

Сохранить

Figure 13. Configurator: configure the displayed data.

Select the desired data and click "Save" to record changes to the display. To exit without saving changes, click "Cancel".

## 6. Fuel tanks

The display shows the current level of fuel in the tank. To use this functionality you must install and properly configure the fuel level sensors in the Mielta terminal. The display supports up to two fuel tanks, each of which can accommodate up to two fuel level sensors:

- Tank-1: FLS-1 and FLS-2
- Tank-2: FLS-1 and FLS-2

There is a possibility of values correction for every FLS within  $[-12.0\%..+12.0\%]$  with a resolution of 0.1%. The fuel level is calculated on the base of the calibration tables stored in the display memory. Each fuel level sensor is mapped to two calibration tables. Each calibration table can contain up to 128 lines. In addition to displaying the fuel level separately for each Tank, it is possible to display the overall level in two Tanks (as the sum of the two levels of Tank-1 + Tank-2). Settings for Tank-1 and Tank-2 are identical and unrelated. To change the settings of the fuel tanks in the configurator use the menu item "Tank 1" and "Tank 2" respectively.

**Топливный бак 1. Настройка датчиков уровня топлива.**

Подключение: СД: слот RS485 - 4 **ДУТ-1**

Коррекция значений ДУТ-1: +1,7%

Таблица № 1

№	Объем, литров	Знач. ДУТ
1	0	30
2	30	251
3	60	467
4	90	672
5	120	872
6	150	1059
7	180	1258
8	210	1456
9	240	1654
10	270	1850
11	300	2044
12	330	2238
13	360	2432
14	390	2626
15	420	2822
16	450	3016
17	480	3212
18	510	3410
19	540	3596
20	560	3732

Таблица № 2

№	Объем, литров	Знач. ДУТ
1		

Подключение: Не подключен **ДУТ-2**


Коррекция значений ДУТ-2: Выкл.


Таблица № 1


№	Объем, литров	Знач. ДУТ
1		

Таблица № 2

№	Объем, литров	Знач. ДУТ
1		

 Очистить таблицу

 Импорт таблицы

 Экспорт таблицы


 Записать таблицы

Figure 14. Configurator: window of the fuel tank settings.

Group of settings in the left part of the window can be used to change parameters of FLS-1, the right side – FLS-2. For each fuel level sensor (FLS-1 and FLS-2) the following actions are available:

- select a method of FLS connection to the satellite terminal
- setting of FLS values correction
- work with calibration tables

Examine each action in more detail.

### **Selection a method of FLS connection to the satellite terminal**

The fuel level sensor can be connected to the satellite terminal by many ways:

- FLS is connected to frequency input
- FLS is connected via RS232 interface
- FLS is connected via RS-485 interface (slots 1..8 of the satellite terminal)

To configure the way of FLS connecting, click on the line (link) at the top of the window:

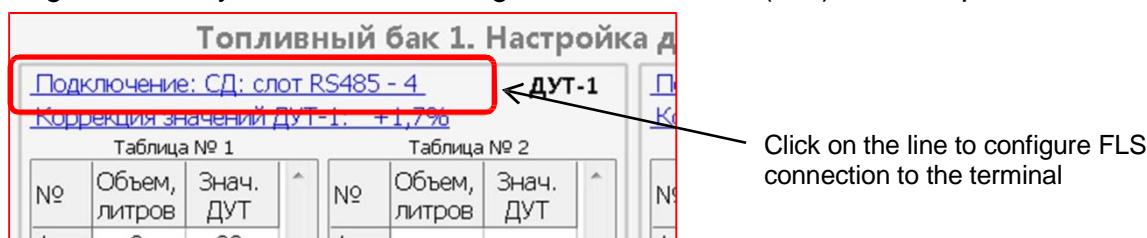


Figure 15. Configurator: settings of FLS connection.

In the opened window select the required connection option. Click "Save" to record changes into the display memory. If changes do not need to be saved, click "Cancel".

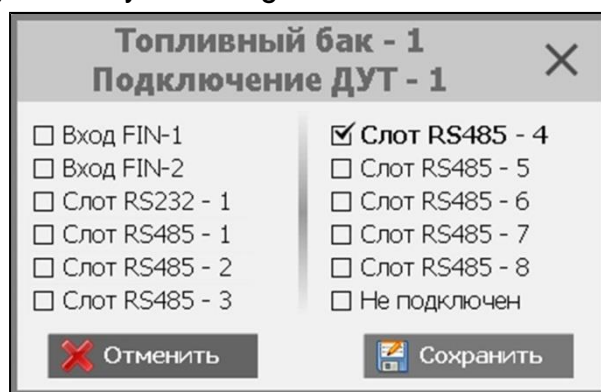


Figure 16. Configurator: FLS data source selection.

### **Setting of fuel level sensor values correction**

Correction values of the fuel level sensor is applied in cases when discrepancies between the actual level of fuel in the tank and the data of calibration tables linked to a seasonal factor (e.g., calibration was conducted in the summer and in winter FLS values of winter diesel fuel has changed). The use of such correction allows a re-calibration. The correction value can be set in the range of  $[-12,0\% .. +12,0\%]$  with a resolution of 0.1%. To disable the correction, enter a value of 0%. To change the correction values, click on the line (link) at the top of the window:

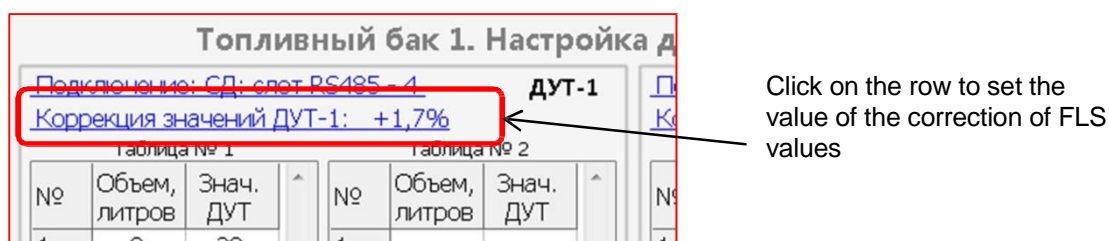


Figure 17. Configurator: FLS correction settings

In the opened window enter the desired correction value and press the "Apply" button to record the new value in display memory. If you do not need to save changes, click "Cancel".



Figure 18. Configurator: input of the correction value of FLS.



## 6.1. Work with calibration tables

For the calibration tables provided following actions:

- manually edition of the table
- clear the selected calibration table
- import data into the selected calibration table from Excel file
- export data from a selected calibration table to an Excel file
- recording of calibration tables into the display memory

**Attention.** All changes to tables are stored in the configurator memory! To save the changes in the display, press "Record table" at the bottom of the window.

### Manual editing of calibration tables

In this mode, the data input into the calibration table is performed by using the keyboard. It allows to add new rows into the table and deletes any rows from the table. To perform these actions, select the cell in the required row in the table and click the right mouse button. In the opened context menu select the required action. A new row will be inserted before the chosen row. When you deleting a row, a selected row will be deleted.

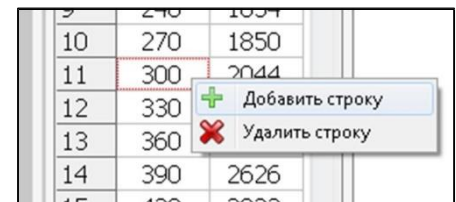


Figure 19. Configurator: context menu of the calibration table.

**Attention.** All changes in tables are recording to configurator memory! To save the changes in the display, press "Record table" at the bottom of the window.

### Clear the selected calibration table

To completely clear the calibration table, use the "Clear table" button at the bottom of the window. Select the desired table (or multiple tables) in the opened window by clicking on the appropriate icon and pressing the "Clear" button. If tables' clearing is not required, click "Cancel".

**Attention.** Cleaning tables is performed in the configurator memory! To save the changes in the display, press "Record table" at the bottom of the window.

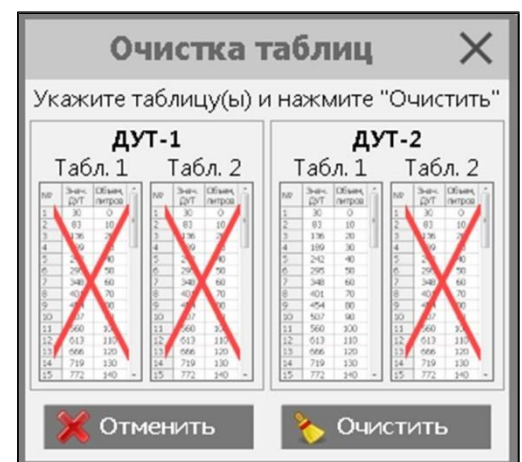


Figure 20. Configurator: calibration tables cleaning.

### Data import into the selected calibration table from Excel file

In addition to manual edit of the tables configurator provides with the ability to import data into calibration table from Excel spreadsheet file. The format of the Excel spreadsheet has the following requirements. The table consists of three columns: Row number (№), Fuel volume in the tank (liters), Value of fuel level sensor (FLS). In row 1 is the header of the table. Data are performed starting from row 2.

	A	B	C
1	№	Литров	ДУТ
2	1	0	30
3	2	30	251
4	3	60	467
5	4	90	672
6	5	120	872
7	6	150	1059
8	7	180	1258
9	8	210	1456
10	9	240	1654
11	10	270	1850
12	11	300	2044

Figure 21. Excel spreadsheet format.

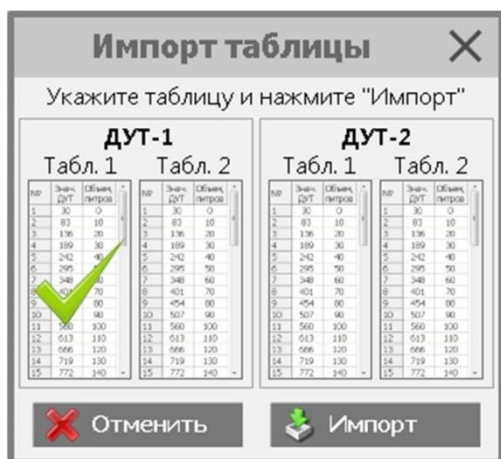


Figure 22. Configurator: calibration table import from the Excel file.

To import data click "Import table" in the bottom of the window. In the opened window select the desired table by clicking on the corresponding icon. Then click "Import" and select the Excel spreadsheet file from which data is to be imported in the selected calibration table.

**Attention.** Imported data are stored in configurator memory! To store the changes in the display, press "Record table" at the bottom of the window.

### Export of a selected calibration tables data to an Excel file

The configurator provides with the ability to upload data of any calibration table to an Excel spreadsheet file. The export process creates a file of the format that was described in the section "Import the calibration table from the Excel file". To export the table contents, click "Export table" at the bottom of the window. In the opened window, select the desired table by clicking on the corresponding icon. Then click "Export" and enter the file name of an Excel spreadsheet in which the data of the selected calibration table will be saved.

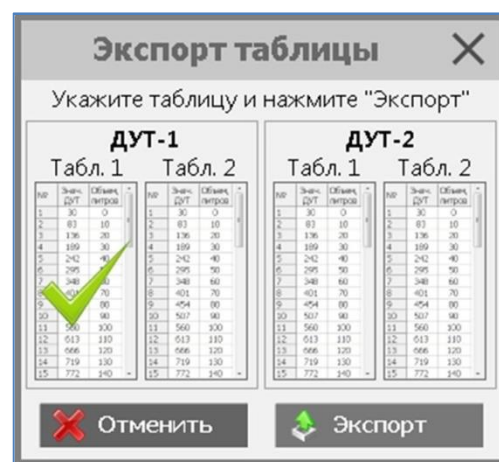
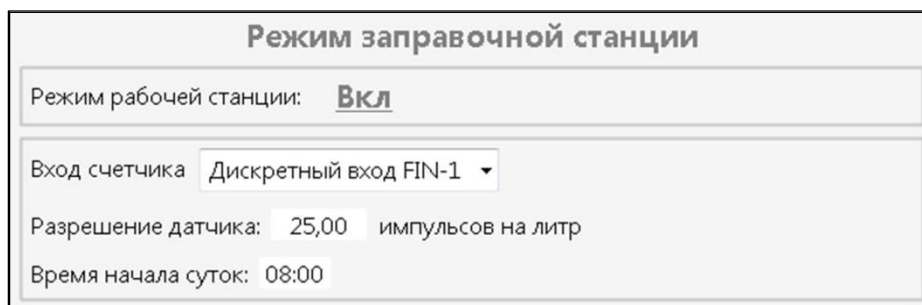


Figure 23. Configurator: exports the calibration table to an Excel file.



## 7. Gas station mode

In the display it is present a possibility to work as a part of gas station. To work in a gas station mode, corresponding settings of the terminal must be conducted, and a flow meter (RSD) must be connected. In the gas station mode display receive the number of RSD pulses from the terminal, recalculate them in litres and keeps a cumulative total of recorded volume of filling. Display settings for this mode are located in the item "Gas station".



Режим заправочной станции	
Режим рабочей станции:	<b>Вкл</b>
Вход счетчика	Дискретный вход FIN-1 ▾
Разрешение датчика:	25,00 импульсов на литр
Время начала суток:	08:00

Figure 24. Configurator: window of gas station mode settings.

To enable or disable the gas station mode, click on the word "On" ("Off"), the mode status will change to the opposite.

Use the "Counter input" to choose the input of satellite terminal, which is connected to the fuel consumption sensor (RSD).

Specify the resolution of the fuel consumption sensor (in pulses per liter).

Enter the time of day start (to account the amount of daily issuance) in the appropriate field.

The status of each parameter change is displayed in the bottom of configurator window in the status bar.

## 8. Work with iButton keys

The display supports with the ability of visualization of textual information, that is mapped to a particular ID of the iButton key. With this purpose, key database is written to the display. Each database record is a line:

ID iButton key ↔ "Test row"

To configure the mode use the "iButton" menu item.

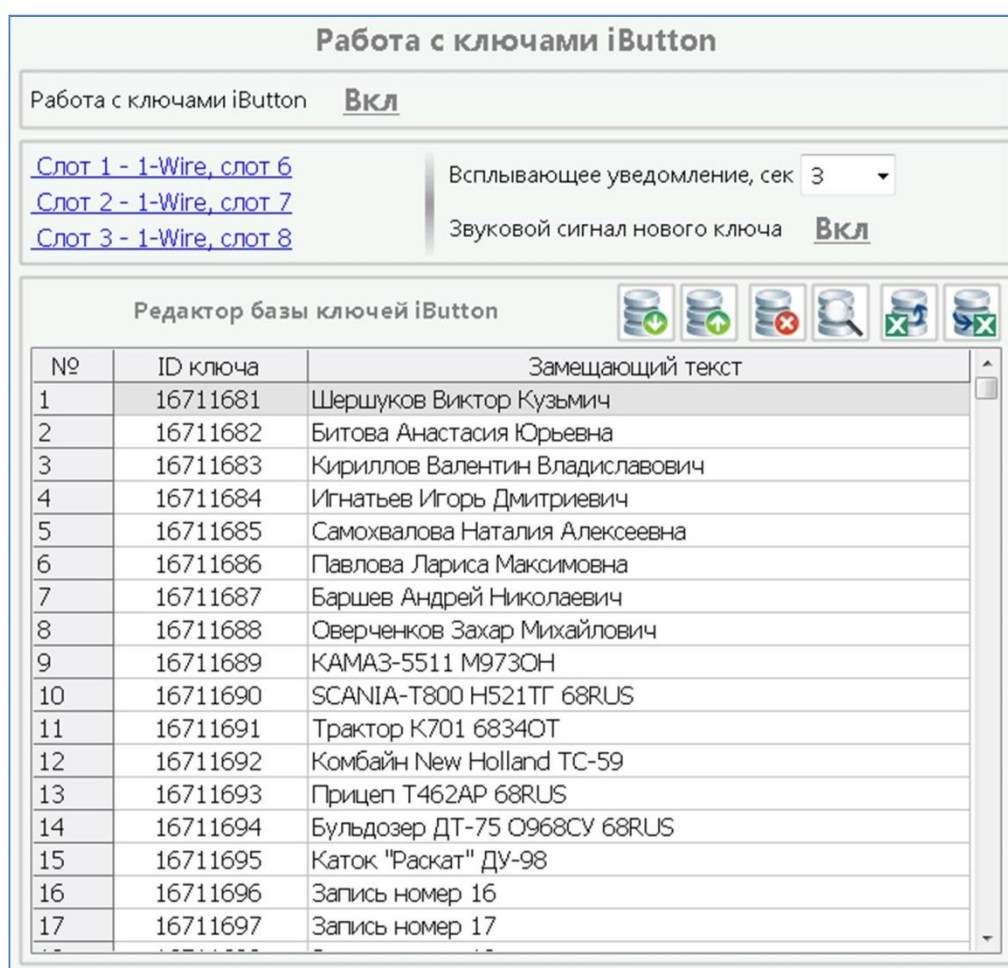


Figure 25. Configurator: iButton menu

To enable or disable the mode of operation with iButton keys, click the mouse on the word "On" ("Off"), the mode status will change to the opposite. If the mode is disabled, the interface elements for changing the mode settings will be hidden.

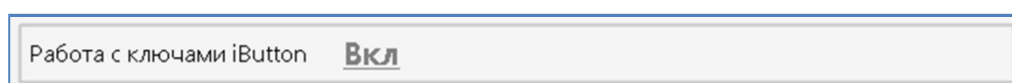


Figure 26. Configurator: enable/disable of iButton keys mode

The display supports up to three slots for receiving data from a satellite terminal. Each slot of the display (not confuse with the slot sensors of the terminal) may be configured to receive data from any one of the eight 1-Wire satellite terminal slots. To configure the data source click on the appropriate link in

the configurator window:



Figure 27. Configurator: setting of iButton display slots

In the opened window, specify the slot of the terminal, which will be polled by the display. Note that the selected slot in the terminal must be properly configured (iButton key must be selected as a sensor, and a range of IDs must be optionally specified). If the slot in the display is not used, select "Not poll".

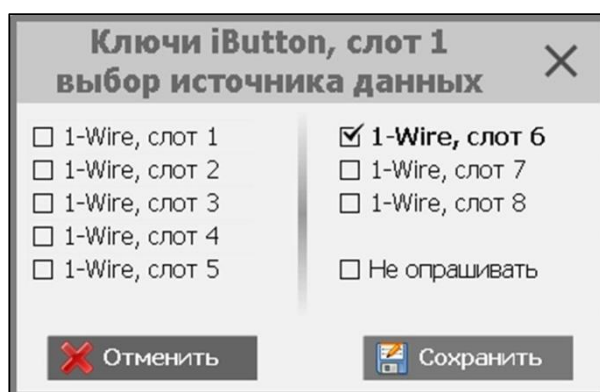


Figure 28. Configurator: select a data source for iButton slot

The display provides with the ability to display a notification about a new iButton key. It can be used in cases when the display screen is required to constantly display information not about the keys (for example, the status of the terminal), but is required to monitor the emergence of new iButton keys. Notification time can be configured in the range of 1..60 sec. Select the required display time of the notification from the list, or enter it manually. If the notification is not needed to be displayed, select "Off".

In addition to the notification display can beep when a new iButton key is added. To enable or disable beep press the mouse on the string "On" ("Off"). The parameter status will be changed to the opposite.

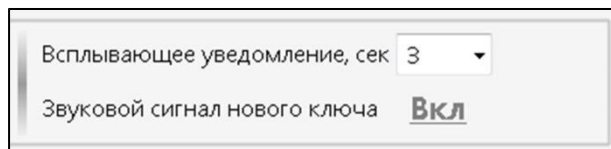


Figure 29. Configurator: notifications and sound signal setting.

## 8.1 Redactor of iButton keys base

The display contains the iButton keys. Each database record is a line:

*ID iButton key ↔ "Test row"*

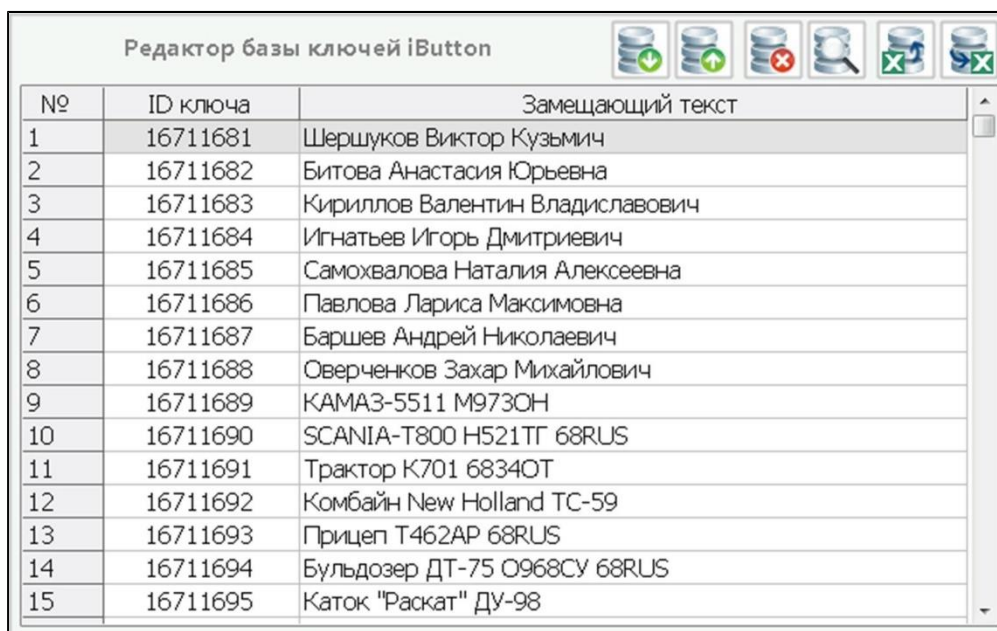
iButton keys database has the following limitations:

*The maximum number of records in the database: 1100*

*Valid values of ID keys: [1.. 4294967294] (0x00000001.. 0xFFFFFFFFE)*

*Maximum length of a text string: 33 characters*

In the work process, display searches the required ID in database and displays the corresponding text string on the screen. If the search in the database gives no results, the screen displays ID and message that the ID search in the database is failed. All operations with database keys are performed in the menu item "iButton keys database editor".



№	ID ключа	Замещающий текст
1	16711681	Шершуков Виктор Кузьмич
2	16711682	Битова Анастасия Юрьевна
3	16711683	Кириллов Валентин Владиславович
4	16711684	Игнатьев Игорь Дмитриевич
5	16711685	Самохвалова Наталия Алексеевна
6	16711686	Павлова Лариса Максимовна
7	16711687	Баршев Андрей Николаевич
8	16711688	Оверченков Захар Михайлович
9	16711689	КАМАЗ-5511 М973ОН
10	16711690	SCANIA-T800 H521TF 68RUS
11	16711691	Трактор К701 6834ОТ
12	16711692	Комбайн New Holland TC-59
13	16711693	Прицеп Т462АР 68RUS
14	16711694	Бульдозер ДТ-75 О968СУ 68RUS
15	16711695	Каток "Раскат" ДУ-98

Figure 30. Configurator: iButton keys base editor.

Configurator allows you to perform the following operations:

- download iButton keys database from the display into the database editor
- record iButton keys database from the editor to display
- clear the base of iButton keys
- apply a filter of the records to the database (search of records)
- import iButton keys database from Excel file
- export base of iButton keys to an Excel file
- add a new record to the iButton keys database
- delete an existing record from the iButton keys database
- edit an existing record in the of iButton keys database
- sort the records in the database

**ATTENTION! Operations with the database (adding/modifying/deleting records, the database export/import to/from Excel file(s), data cleansing) are carried out with the base loaded in the configurator memory. To save changes in the database, you need to record the database to display.**

In the upper right corner of the iButton keys editor window is settled a toolbar that provides access to the following operations:

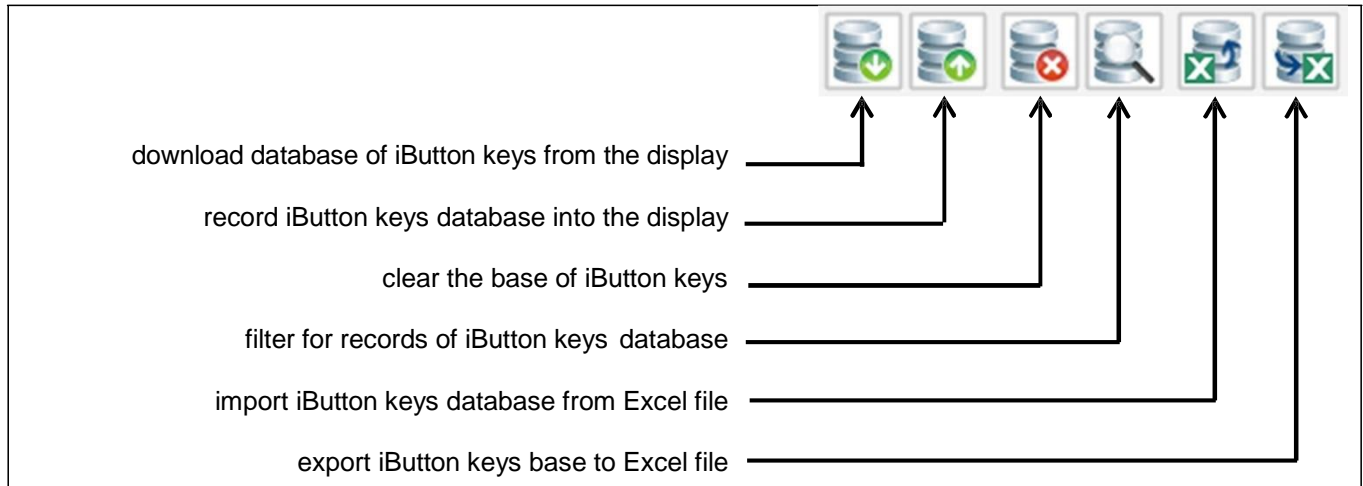


Figure 31. Configurator: functional buttons to work with the base of iButton keys

### **iButton keys database downloads from the display.**

To download the database from the display, press the corresponding button on the toolbar. The process of full database (1100 records) downloading from the display takes about 10 seconds. It is impossible to interrupt the download process. The progress of the downloading is displayed on the status bar at the bottom of the configurator window.

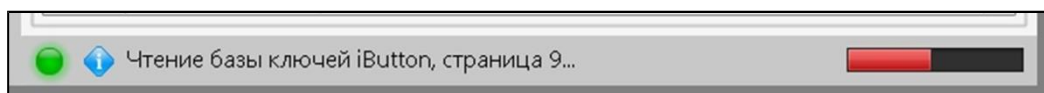


Figure 32. Configurator: iButton keys base downloading from the display.

After loading the status bar will display the number of downloaded records.

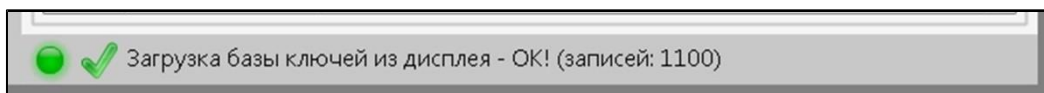


Figure 33. Configurator: loading bases from the display is completed.

### **Saving of the iButton keys base into the display.**

After making changes to the iButton keys database it is necessary to save them into the display. To save the database in the display, press the corresponding button on the toolbar. The saving process of full database (1100 records) in the display takes about 10 seconds. It is impossible to interrupt the recording process. The course of the recording process is displayed on the status bar at the bottom of the configurator window.

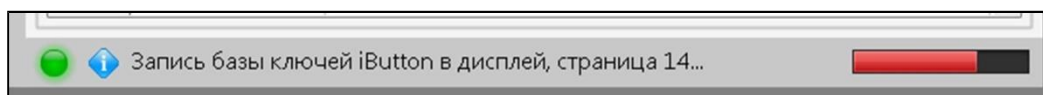


Figure 34. Configurator: saving the base of the iButton keys in the display.

### **Cleaning the base of the iButton keys.**

To delete all records from the iButton keys database, press the corresponding button on the toolbar. The screen will display a window where you will confirm the operation. To delete all records from the database, click "Clear". To cancel the operation, click "Cancel".

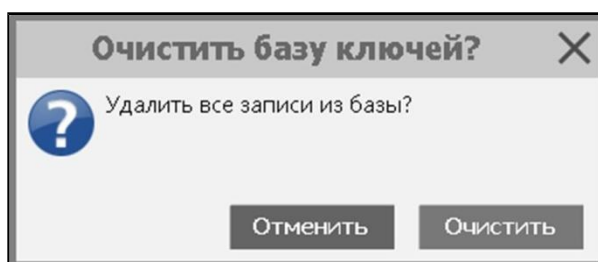


Figure 35. Configurator: clearing the iButton keys base.

### **Filter for records in iButton keys database (search of records in the database).**

To filter the database records, click the corresponding button on the toolbar. You will see a window that lets you adjust parameters of the filter.

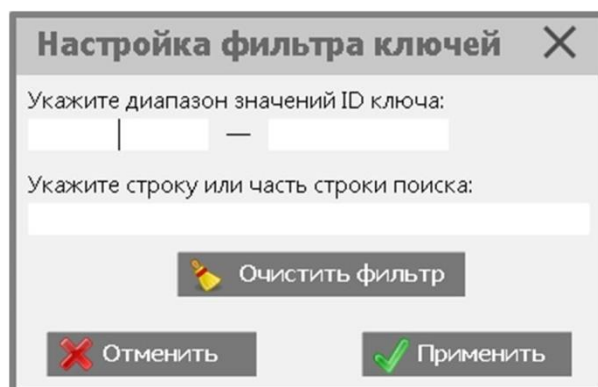


Figure 36. Configurator: filter for records in iButton keys database.

If you want to display all records in the database (to disable the filter), click "Clear filter", then click "Apply".

If you want to find records that contain some text, type this text (or part of text) in the appropriate filter field and click "Apply". Search text is insensitive for characters case. If the field for text search is empty, then the text filter is not applied.

To display records with a known ID, specify the ID in both filter fields (the range of ID values). The text fields leave empty. Click "Apply".



If you want to display the records which ID is included in a certain range, enter the boundary values of the range in the appropriate filter fields and click "Apply".

### **Import records from Excel file.**

To correctly import data from an Excel file the format of the table must strictly match the following format.

The table must contain three columns:

- Column № 1: record number
- Column № 2: ID key
- Column № 3: text string

The first row of the table contains the column headings.

Directly data start from the second row of the table.

	A	B	C	D
1	№	ID ключа	Текст	
2	1	16 711 681	Шершуков Виктор Кузьмич	
3	2	16 711 682	Битова Анастасия Юрьевна	
4	3	16 711 683	Кириллов Валентин Владиславович	
5	4	16 711 684	Игнатьев Игорь Дмитриевич	
6	5	16 711 685	Самохвалова Наталия Алексеевна	
7	6	16 711 686	Павлова Лариса Максимовна	

Figure 37. The format of the Excel spreadsheet.

To import records from the Excel spreadsheet, click the corresponding button on the toolbar and specify the desired file on the disk.

### **Export records to Excel file.**

To export records to the Excel table, press the corresponding button on the toolbar and specify the desired file on the disk. The format of the export table is the one described in the section "Import records from Excel file".

In addition to the toolbar context menu is used to work with the database key, accessed by pressing the right mouse button on the database table in the configurator window.

1682	Битова Анастасия Юрьевна
1683	Кириллов Валентин Владиславович
1684	Игнатьев Игорь Дмитриевич
1685	Добавить новую запись
1686	Изменить выделенную запись
1687	Удалить выделенную запись
1688	Оверченков Захар Михайлович
1689	КАМА3-5511 М973ОН

Figure 38. Configurator: context menu of the iButton keys database.

The context menu contains the following operations:

- add a new record to the database
- change an existing record in the database
- delete an existing record in the database

### **Adding a new record to the iButton keys database.**

To add a new record to the database, select the appropriate option in the context menu. In the opened window enter the ID key and text corresponding to this key. Then click "Add".

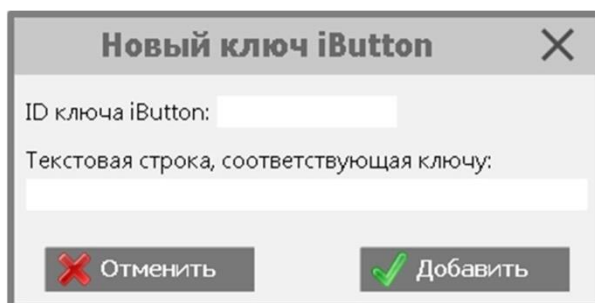


Figure 39. Configurator: add a new record to the iButton keys database.

### **Changing an existing record in iButton keys base.**

If you want to change an existing record in the database, check the corresponding string in the configurator base, then open the context menu and select "Change selected record". Another way to edit record – double-click on the desired row in the table. In the window that opens make the necessary changes to values field and click "Modify" to save changes to the database.

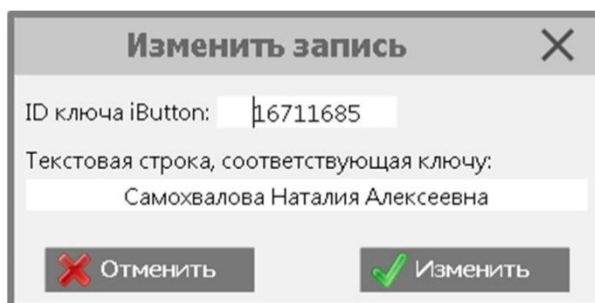


Figure 40. Configurator: changing records of iButton keys database.

**ATTENTION.** *If you change an existing record, the following algorithm is used. After pressing the button "Modify" selected for change record is removed from the database. Then base is added with a new record with field values entered by the user in the "Edit record" window.*

### **Delete an existing record from iButton keys database.**

If you want to delete the existing record from the database, check the base string in the configurator, then open the context menu and select "Delete selected record". In the window that opens confirm the operation by pressing the "Delete" button. If record remove is not required, click "Cancel".



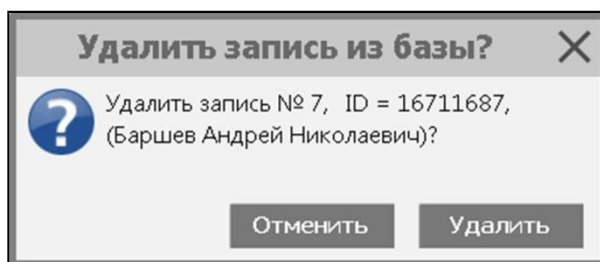


Figure 41. Configurator: remove records from iButton keys database.

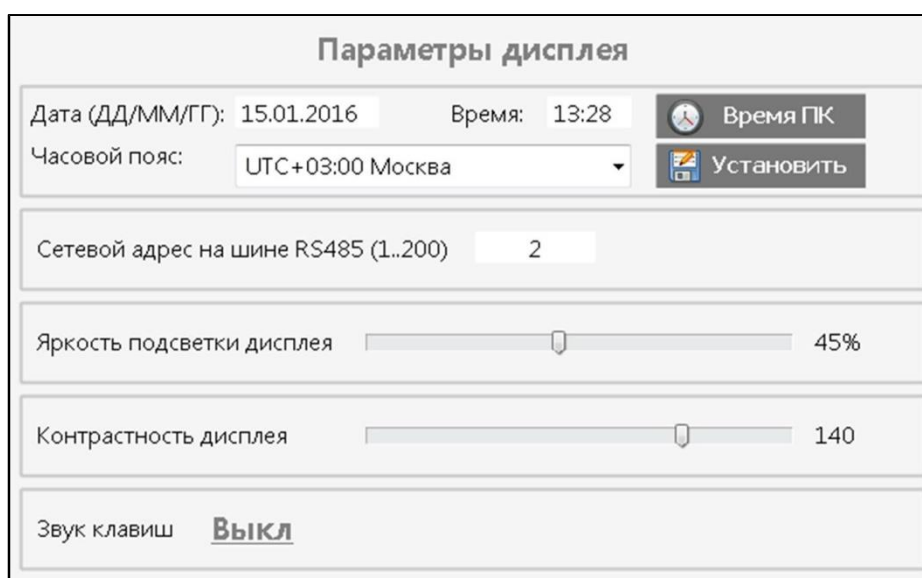
**ATTENTION! Operations with the database (adding/modifying/deleting records, the database export/import to/from Excel file(s), data cleansing) are carried out with the base loaded in the configurator memory. To save database changes, you must save the database to display.**

## 9. Configuring of display system parameters


System parameters of the display include:


- date, time and time zone
- network address of the display on the RS485 bus
- brightness of the display
- display contrast
- sound of display buttons

To configure system settings in the configurator is designed the menu item "Settings":





Параметры дисплея

Дата (ДД/ММ/ГГ): 15.01.2016      Время: 13:28       Время ПК

Часовой пояс: UTC+03:00 Москва       Установить

Сетевой адрес на шине RS485 (1..200)      2

Яркость подсветки дисплея       45%

Контрастность дисплея       140

Звук клавиш      **Выкл**

Figure 42. Configurator: display settings configuring.

Display has a built-in clock module, which uses coordinated universal time (UTC). Therefore, to see time on the display, you must specify your time zone.

The current date and time can be entered manually in the corresponding fields of the configurator, or by click the "PC time"; in this case, the date, time, and time zone fields will be filled automatically from the current settings of the computer on which the program is running. To record the new settings of date and time, press the "Install" button.

**Remark.** When you connect the display to the satellite terminal there is an automatic time synchronization with the navigation satellites. Thus, for correct time reflection on the display is enough to specify the time zone. Display will obtain time and date from the terminal.

To install the network address of the display on the RS485 bus, enter the value in the appropriate input box of the configurator. Valid address range: 1..200.

The display brightness and contrast can be set using the corresponding elements of the configurator. To disable the display backlight set the backlight brightness to 0%.

To enable or disable the sound when pressing the display buttons, click on the link "On" ("Off"). The state of the parameter will switches to the opposite.

## 10. Import and export of display system parameters

**ATTENTION!** Data calibration tables are not included into process of parameters import/export. To import and export the contents of the calibration tables, use procedure specially designed for this (see section about working with the calibration tables).

**ATTENTION!** The data of iButton keys base are not included into process of parameters import/export. To import and export iButton keys base use procedure specially designed for this (see section about working with the iButton keys base editor).

To import and export settings use the "Service" item of the configurator.

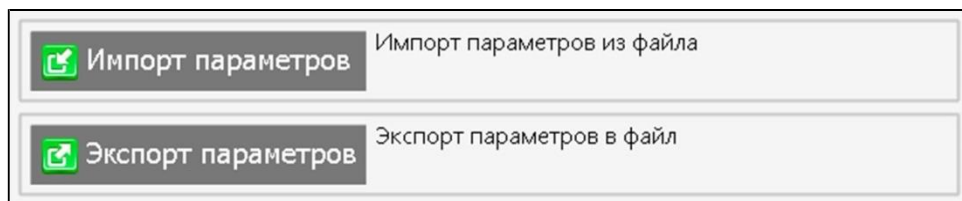


Figure 43. Configurator: import and export of display settings.

To import settings from a file, click the "Import settings" and choose the file from which parameters will be loaded into the display.

To export the current display settings, click the "Export settings" and specify the file for saving display settings.

## 11. Display software update

Company Melta is constantly working on expanding the functionality and improving the user qualities of their products. In this regard, company release software updates for devices (firmware). To install the update on a device, use the "Update" item of the "Service" menu.

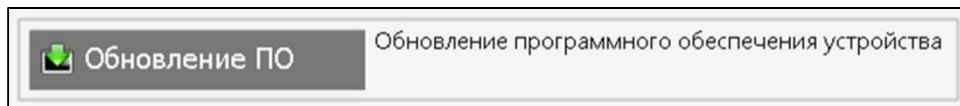


Figure 44. Configurator: display software for updating.

The current software version of the display you can see in the item "Page" in the lower right corner of the window:

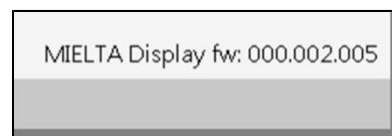


Figure 45. Configurator: view the current software version of the display.

Updated versions of the software are posted on the website of the company at the address <http://mielta.ru>.

To install the display software update click on the "Service" item and press "Update software" button.

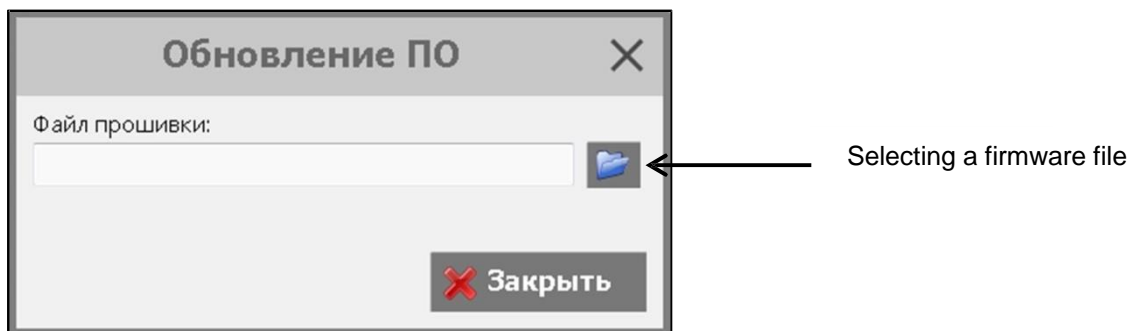


Figure 46. Configurator: select file of the display firmware.

Click the button of firmware file selection and select the required file. Configurator will check the correctness of the specified file, and if successful, the "Close" button will changes to "Update". To start the update process, click "Update". During the updating, do not power off the display and do not interrupt the update process.

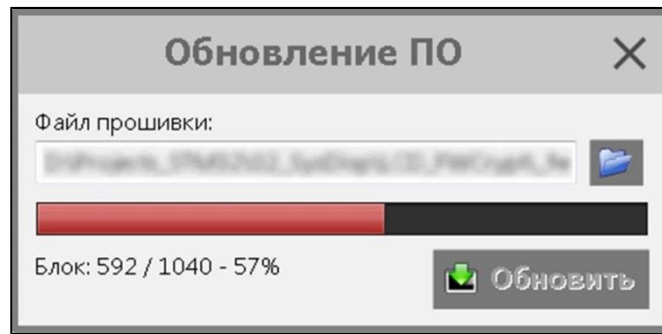


Figure 47. Configurator: display firmware update process.

After the update is complete the program displays a success message, or an error message, when errors occurred during the update. During the update the display will be reloaded twice.

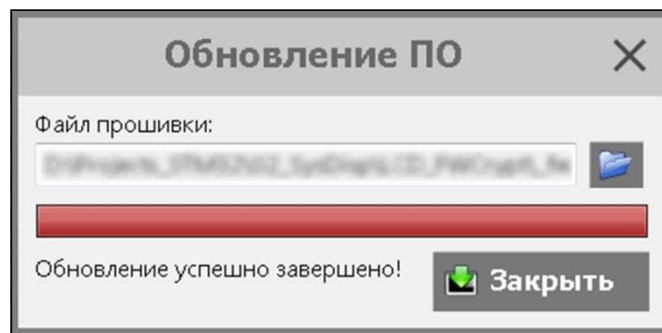


Figure 48. Configurator: display firmware update is completed.

### **Emergency update mode**

If a failure occurred in the process of display software updating, and as a result of this failure display is not working, it is possible to recover the device. It is necessary to turn on the device in service mode. The boot procedure consists of the following:

1. Power off the display
2. Press and hold the two buttons: "Up" and "Select/Confirm"
3. Apply power to the display
4. On the display screen should now display "SERVICE MODE", the backlight will slowly flash
5. Release the held buttons
6. With the help of configurator start the display software update in accordance with the above instructions. From emergency mode, the display will automatically boot in normal mode.

## 12. Information about the configurator program version

To see the current version of the configurator, click the question mark icon in the upper right corner of the program:



Figure 49. Configurator: view information about the program version.

## The options for the fuel level sensors installation and calibration tables apply

Depending on the fuel tank shape various methods of installation of fuel level sensors are using. This annex shows some practical examples of the fuel tanks shape and possible ways of installation of fuel level sensors, and also explains the rules for compiling the display calibration tables for each case.

### 1. A simple fuel tank in the form of a rectangular parallelepiped, one fuel level sensor.

This case is the simplest. The tank has the form of a rectangular parallelepiped, one fuel level sensor shall be installed on the tank (usually on the center of the tank). In this case, prepared one calibration table, each row contains the dependence of the fuel volume and the sensor reading of the fuel level. This table is recording to the display memory. In this case, the table can be loaded into **any one of four** possible locations:

- FLS-1, table-1
- FLS-1, table-2
- FLS-2, table-1
- FLS-2, table-2

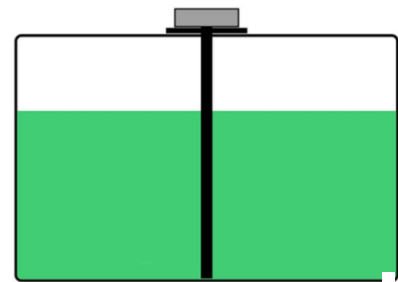


Figure 50. A simple tank.

The remaining three locations must be empty.

### 2. The fuel tank is in the form of a rectangular parallelepiped, two fuel level sensors.

If the fuel tank is long and narrow, it is necessary to set two FLS to improve the measurement accuracy of the fuel level. In this case calibration table is preparing in which to each fuel level during the calibration maps two values from the fuel level sensors. Then the table splits into two tables for each FLS respectively.



Figure 51. Long tank, 2 FLS.

**Important:** when calculating the level of fuel in the tank by calibration tables, display produces the summation of all values found for each sensor and each table. I.e. if by the data from FLS-1 and the corresponding calibration table the fuel level in the tank is, for example, 49 l., and according to the data from FLS-2 and its table – 51 l., the display will show a volume of 100 l.



This fact must be considered when preparing the tables for display, and for the case of two tables the values in liters must be divided in half.

### 3. Complex shape fuel tank, two fuel level sensors.

The figure shows an example of a complex shape tank that has two fuel level sensors. In this case, there are two ways of compiling the calibration tables.

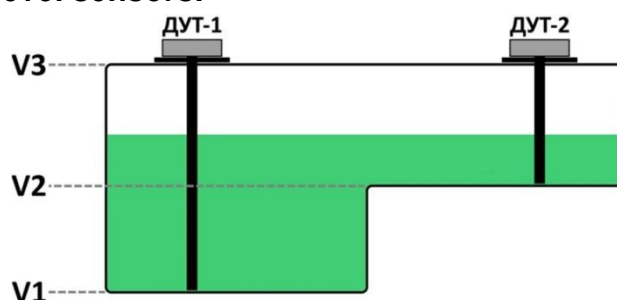


Figure 52. Complex tank, 2 FLS

#### **Method 1** (one table for each FLS)

Table 1

Part of the Tank	FLS-1	FLS-2
V1 – V2	the value of the fuel volume increases and corresponds to the actual volume of fuel in the tank $V_{FLS} = V_{act}$	the value of the fuel volume is constant and equal to zero $V_{FLS} = 0$
V2 – V3	the value of the fuel volume increases and calculated by the following formula: $V_{FLS} = V_2 + \frac{V_{act} - V_2}{2} = \frac{V_2 + V_{act}}{2}$	the value of the fuel volume increases and calculated by the following formula: $V_{FLS} = \frac{V_{act} - V_2}{2}$

#### **Method 2** (two tables for FLS-1 and one for FLS-2)

Table 2.

Part of the Tank	FLS-1		FLS-2
	table 1	table 2	table 1
V1 – V2	$V_{FLS} = V_{act}$	$V_{FLS} = 0$	$V_{FLS} = 0$
V2 – V3	$V_{FLS} = V_2$	$V_{FLS} = \frac{V_{act} - V_2}{2}$	$V_{FLS} = \frac{V_{act} - V_2}{2}$

As an example, consider the following table obtained during the calibration of the above type tank 150l capacity (volume of the fuel level V2 is equal to 50l).

Table 3.

Part of the Tank	№	Fuel volume, l	FLS-1	FLS-2
V1-V2	1	0	30	30
	2	10	330	30
	3	20	630	30
	4	30	930	30
	5	40	1230	30
	6	50	1530	30
V2-V3	7	60	1680	430
	8	70	1830	830

	9	80	1980	1230
	10	90	2130	1630
	11	100	2280	2030
	12	110	2430	2430
	13	120	2580	2830
	14	130	2730	3230
	15	140	2880	3630
	16	150	3030	4030

For the first method of tables creating (one table per FLS), we obtain the following tables (for clarity, the rows associated with the source data).

Table 4.

Part of the Tank	№	Fuel volume, l
V1-V2	1	0
	2	10
	3	20
	4	30
	5	40
	6	50
V2-V3	7	60
	8	70
	9	80
	10	90
	11	100
	12	110
	13	120
	14	130
	15	140
	16	150

№	FLS-1	
	liters	value
1	0	30
2	10	330
3	20	630
4	30	930
5	40	1230
6	50	1530
7	55	1680
8	60	1830
9	65	1980
10	70	2130
11	75	2280
12	80	2430
13	85	2580
14	90	2730
15	95	2880
16	100	3030

№	FLS-2	
	liters	value
1	0	30
2	5	430
3	10	830
4	15	1230
5	20	1630
6	25	2030
7	30	2430
8	35	2830
9	40	3230
10	45	3630
11	50	4030

When you load the table into a display using the configurator, you can choose the boot into "Table 1" or "Table 2", it is important that the data are loaded into one table and the other table should remain empty.

For the second method, three tables drawn up, two tables for FLS-1 and one table for FLS-2.

**Comment.** Display uses the following rule in calculating the amount of fuel by calibration table. If the value of the FLS exceeds the maximum value in the table, the maximum value in the table will be taken as a fuel amount. In the example below in table 1 for FLS-1 maximum value of FLS is equal to 1530. For any values of FLS that excess 1530, the display will use a value of 50 l for calculations.

Table 5.

Part of the Tank	№	Fuel volume, l	№	FLS-1, tab.1		№	FLS-1, tab. 2		№	FLS-2, tab. 1	
				liters	value		liters	value		liters	value
V1-V2	1	0	1	0	30						
	2	10	2	10	330						
	3	20	3	20	630						
	4	30	4	30	930						
	5	40	5	40	1230						
	6	50	6	50	1530	1	0	30	1	0	30

V2-V3	7	60
	8	70
	9	80
	10	90
	11	100
	12	110
	13	120
	14	130
	15	140
	16	150

	50	
	50	
	50	
	50	
	50	
	50	
	50	
	50	
	50	
	50	

2	5	1680
3	10	1830
4	15	1980
5	20	2130
6	25	2280
7	30	2430
8	35	2580
9	40	2730
10	45	2880
11	50	3030

2	5	430
3	10	830
4	15	1230
5	20	1630
6	25	2030
7	30	2430
8	35	2830
9	40	3230
10	45	3630
11	50	4030

#### 4. Complex shape fuel tank, two fuel level sensors.

The figure shows an example of a complex shape tank that has two fuel level sensors. In this case, there are two ways of compiling the calibration tables.

##### Method 1 (one table for each FLS)

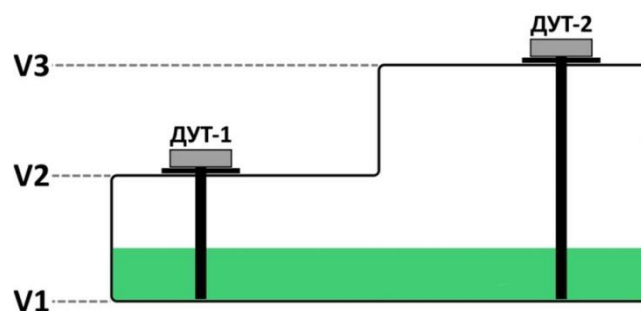


Figure 53. Complex tank, 2 FLS.

Table 6

Part of the Tank	FLS-1	FLS-2
V1 – V2	the value of the fuel volume increases and corresponds to the actual volume of fuel in the tank $V_{FLS} = \frac{V_{act}}{2}$	the value of the fuel volume increases and corresponds to the actual volume of fuel in the tank $V_{FLS} = \frac{V_{act}}{2}$
V2 – V3	the value of the fuel volume is constant and calculated by the following formula: $V_{FLS} = \frac{V2}{2}$	the value of the fuel volume increases and calculated by the following formula: $V_{FLS} = V_{act} - \frac{V2}{2}$

##### Method 2 (two tables for each FLS)

Table 7.

Part of the Tank	FSL-1	FLS-2	
	table 1	table 1	table 2
V1 – V2	$V_{FLS} = \frac{V_{act}}{2}$	$V_{FLS} = \frac{V_{act}}{2}$	$V_{FLS} = 0$
V2 – V3	$V_{FLS} = \frac{V2}{2}$	$V_{FLS} = \frac{V2}{2}$	$V_{FLS} = V_{act} - V2$

As an example, consider the following table obtained during the calibration of the above type tank with the capacity of 150 liters (the volume of the fuel level V2 is equal to 100 l).

Table 8.

Part of the Tank	No	Fuel volume, l	FLS-1	FLS-2
V1-V2	1	0	30	30
	2	10	430	180
	3	20	830	330

	4	30	1230	480
	5	40	1630	630
	6	50	2030	780
	7	60	2430	930
	8	70	2830	1080
	9	80	3230	1230
	10	90	3630	1380
	11	100	4030	1530
V2-V3	12	110	4030	1830
	13	120	4030	2130
	14	130	4030	2430
	15	140	4030	2730
	16	150	4030	3030

For the first method of tables creating (one table per FLS), we obtain the following tables (for clarity, the rows are associated with source data).

Table 9.

Part of the Tank	№	Fuel volume, l	FLS-1		№	FLS-2		
			liters	value		liters	value	
V1-V2	1	0	1	0	30	1	0	30
	2	10	2	5	430	2	5	180
	3	20	3	10	830	3	10	330
	4	30	4	15	1230	4	15	480
	5	40	5	20	1630	5	20	630
	6	50	6	25	2030	6	25	780
	7	60	7	30	2430	7	30	930
	8	70	8	35	2830	8	35	1080
	9	80	9	40	3230	9	40	1230
	10	90	10	45	3630	10	45	1380
	11	100	11	50	4030	11	50	1530
V2-V3	12	110		50		12	60	1830
	13	120		50		13	70	2130
	14	130		50		14	80	2430
	15	140		50		15	90	2730
	16	150		50		16	100	3030

For the second method three tables are composed: one table for FLS-1 and two tables for FLS-2.

Table 10.

Part of the Tank	№	Fuel volume, l	FLS-1, tab.1		№	FLS-2, tab. 1		№	FLS-2, tab. 2	
			liters	value		liters	value		liters	value
V1-V2	1	0	1	0	30	1	0	30		
	2	10	2	5	430	2	5	180		
	3	20	3	10	830	3	10	330		
	4	30	4	15	1230	4	15	480		
	5	40	5	20	1630	5	20	630		
	6	50	6	25	2030	6	25	780		
	7	60	7	30	2430	7	30	930		
	8	70	8	35	2830	8	35	1080		
	9	80	9	40	3230	9	40	1230		
	10	90	10	45	3630	10	45	1380		
	11	100	11	50	4030	11	50	1530	1	0
V2-V3	12	110		50			50		2	10
	13	120		50			50		3	20
	14	130		50			50		4	30
	15	140		50			50		5	40
	16	150		50			50		6	50

### 5. Complex shape fuel tank, two fuel level sensors.

The figure shows an example of a complex shape tank that has two fuel level sensors. In this case, there are two ways of compiling the calibration tables: one table for each FLS, and two tables for each FLS.

**Method 1** (one table for each FLS). Table for FLS is loaded into configurator either as "Table 1" or "Table 2". The remaining table should be empty.

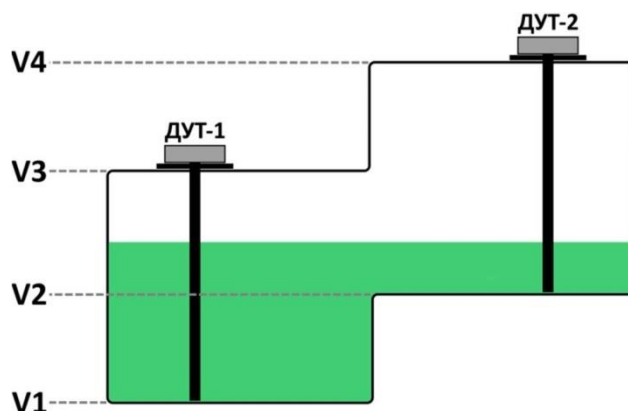


Figure 54. Complex tank, 2 FLS.

Table 11.

Part of the Tank	FLS-1	FLS-2
V1 – V2	the value of the fuel volume increases and corresponds to the actual volume of fuel in the tank: $V_{FLS} = V_{act}$	the value of the fuel volume are constant and equal to zero: $V_{FLS} = 0$
V2 – V3	the value of the fuel volume increases and calculated by the following formula: $V_{FLS} = V_2 + \frac{V_{act} - V_2}{2} = \frac{V_{act} + V_2}{2}$	the value of the fuel volume increases and calculated by the following formula: $V_{FLS} = \frac{V_{act} - V_2}{2}$
V3 – V4	the value of the fuel volume is constant and calculated by the following formula: $V_{FLS} = \frac{V_2 + V_3}{2}$	the value of the fuel volume is constant and calculated by the following formula: $V_{FLS} = V_{act} - \frac{V_2 + V_3}{2}$

#### **Method2** (two tables for each FLS)

In the preparation of two tables for each FLS it must be remembered that the display produces the summation of all values found in each table and for each FLS, so the sum of liters of all the loaded to the display tables should be equal to the required amount of fuel.

Table 12.

Part of the Tank	FLS-1		FLS-2	
	table 1	table 2	table 1	table 2
V1 – V2	$V_{FLS} = V_{act}$	$V_{FLS} = 0$	$V_{FLS} = 0$	$V_{FLS} = 0$
V2 – V3	$V_{FLS} = V_2$	$V_{FLS} = \frac{V_{act} - V_2}{2}$	$V_{FLS} = \frac{V_{act} - V_2}{2}$	$V_{FLS} = 0$
V3 – V4	$V_{FLS} = V_2$	$V_{FLS} = \frac{V_3 - V_2}{2}$	$V_{FLS} = \frac{V_3 - V_2}{2}$	$V_{FLS} = V_{act} - V_3$

As an example, consider the following table obtained during the calibration of the above type tank with the capacity of 200 l (the fuel volume level V2 is equal to 50, the level V3 – 150 l.).

Table 13.

Part of the Tank	№	Fuel volume, l	FLS-1	FLS-2
V1 – V2	1	0	30	30
	2	10	430	30
	3	20	830	30
	4	30	1230	30
	5	40	1630	30
	6	50	2030	30
V2 – V3	7	60	2230	230
	8	70	2430	430
	9	80	2630	630
	10	90	2830	830
	11	100	3030	1030
	12	110	3230	1230
	13	120	3430	1430
	14	130	3630	1630
	15	140	3830	1830
	16	150	4030	2030
V3 – V4	17	160	4030	2430
	18	170	4030	2830
	19	180	4030	3230
	20	190	4030	3430
	21	200	4030	3830

For the first method of creating the tables (one table per FLS), we obtain the following tables (for clarity, the rows associated with the source data).

Table 14.

Part of the Tank	№	Fuel volume, l	№	FLS-1		№	FLS-2	
				liters	value		liters	value
V1 – V2	1	0	1	0	30			
	2	10	2	10	430			
	3	20	3	20	830			
	4	30	4	30	1230			
	5	40	5	40	1630			
	6	50	6	50	2030	1	0	30
V2 – V3	7	60	7	55	2230	2	5	230
	8	70	8	60	2430	3	10	430
	9	80	9	65	2630	4	15	630
	10	90	10	70	2830	5	20	830
	11	100	11	75	3030	6	25	1030
	12	110	12	80	3230	7	30	1230
	13	120	13	85	3430	8	35	1430
	14	130	14	90	3630	9	40	1630
	15	140	15	95	3830	10	45	1830
	16	150	16	100	4030	11	50	2030
V3 – V4	17	160		100		12	60	2430
	18	170		100		13	70	2830
	19	180		100		14	80	3230
	20	190		100		15	90	3430
	21	200		100		16	100	3830

For the second method there are four tables, two tables for each fuel level sensor.

Table 15.

Part of the Tank	№	Volume, liter	№	FLS-1, t.1		№	FLS-1, t. 2		№	FLS-2, t. 1		№	FLS-2, t. 2	
				lit.	value		lit.	value		lit.	value		lit.	value
V1 – V2	1	0	1	0	30									
	2	10	2	10	430									
	3	20	3	20	830									
	4	30	4	30	1230									
	5	40	5	40	1630									
	6	50	6	50	2030									
V2 – V3	7	60		50		1	0	2030	1	0	30			
	8	70		50		2	5	2230	2	5	230			
	9	80		50		3	10	2430	3	10	430			
	10	90		50		4	15	2630	4	15	630			
	11	100		50		5	20	2830	5	20	830			
	12	110		50		6	25	3030	6	25	1030			
	13	120		50		7	30	3230	7	30	1230			
	14	130		50		8	35	3430	8	35	1430			
	15	140		50		9	40	3630	9	40	1630			
	16	150		50		10	45	3830	10	45	1830			
V3 – V4	17	160		50		11	50	4030	11	50	2030	1	0	2030
	18	170		50			50			50		2	10	2430
	19	180		50			50			50		3	20	2830
	20	190		50			50			50		4	30	3230
	21	200		50			50			50		5	40	3430
				50			50			50		6	50	3830