



# LOGGERSOFT

(Software)

## USER MANUAL

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## Table of Contents

1. OVERVIEW .....	4
2. INSTALLATION .....	4
2.1. General information and recommendations .....	4
2.2. Overview of the installation package .....	5
2.3. Interface of the installation package autorun .....	5
2.4. Firebird .....	7
2.5. Database server setup wizard for LoggerSoft .....	13
2.6. LoggerSoft .....	14
3. DESCRIPTION OF THE LOGGERSOFT INTERFACE .....	17
3.1. Main menu .....	17
3.1.1. File menu item .....	17
3.1.2. Operator menu item .....	17
3.1.3. View menu item .....	18
3.1.4. Device Connection menu item .....	18
3.1.5. Tools menu item .....	18
3.1.6. Settings menu item .....	19
3.1.7. Help menu item .....	19
3.2. Standard toolbar .....	19
3.3. Dockable Loggers and Tags panels .....	20
3.3.1. File menu item .....	20
3.3.2. Operator menu item .....	20
3.4. Control panel of the archive browsing .....	21
3.5. Data display area .....	21
3.5.1. Graph .....	21
3.5.2. Table .....	23
3.5.3. Event log .....	23
3.5.4. Report .....	24
3.6. Panel of the summary information about downloaded data .....	25
3.7. Dockable Log Output panel .....	25
3.8. Status bar .....	25
4. LOGGERSOFT OPERATION .....	26
4.1. Launching .....	26
4.2. User Login/Logout .....	26
4.3. Changing the user's password .....	27
4.4. Search for connected devices .....	28
4.5. List of connected devices and selection of the current device .....	30
4.6. Reading the archive from the logger .....	30
4.7. Viewing the archive .....	31
4.8. Print the graph .....	32
4.9. Print the table .....	32
4.10. Print log of logger events .....	32
4.11. Print the report .....	32
4.12. User event log .....	34
4.13. Data export .....	35
5. LOGGERSOFT SETTINGS .....	35
5.1. Data base .....	35
5.2. Administration of user rights .....	36
5.2.1. Editing a user group .....	38
5.2.2. Editing users .....	38

## Table of Contents (continued)

5.3. Supported device types .....	39
5.3.1. General Information .....	39
5.3.2. List of supported device types .....	40
5.3.3. Specification of variables .....	41
5.3.4. Template .....	43
5.4. List of logical parameters of the device .....	43
6. LOGGER SETTINGS .....	44
6.1. Series of loggers .....	44
6.2. Time synchronization .....	44
6.3. Change the text label .....	44
6.4. Change of data on the protocol of metrological attestation .....	45
6.5. Changing the archiving period .....	46
6.6. Adjustment of the LT series loggers .....	47
6.6.1. Archivation tab .....	47
6.6.2. Delayed Start tab .....	48
6.6.3. Measurement channel settings tab .....	49
6.7. Налаштування логерів серії DLT .....	51
6.7.1. Archivation tab .....	51
6.7.2. Start tab .....	53
6.7.3. Buttons tab .....	55
6.7.4. Report tab .....	56
6.7.5. Bookmarks of measurement channel settings .....	57
6.7.6. Dialog of user settings of the sensor .....	60
6.8. Battery replacement .....	60
6.9. Clock calibration .....	61

## 1. OVERVIEW

LoggerSoft software is designed to work with self-powered loggers. Using LoggerSoft, you can configure loggers, read accumulated logs and archives, view and analyze data, as well as print reports. All data that have been read from the loggers are stored in the database and are available for viewing and analysis at any time.

LoggerSoft has a flexible system of demarcation of user rights that allow you to configure different levels of access to data for personnel. Work over a local network with simultaneous access to the data of several users is supported.

LoggerSoft software is distributed free of charge and available for download at [ao-tera.com](http://ao-tera.com).

This document is a complete user manual. It contains information on installing, configuring and working with LoggerSoft software. When starting to work with LoggerSoft software, it is recommended to familiarize yourself with this document.

System requirements:

- Windows 10 operating system.
- The processor is not lower than 1 GHz.
- RAM of at least 512 MB.
- At least 50 MB of free space on the hard disk for program files.
- At least 4 GB of free space on the hard disk for the database.<sup>1</sup>
- TCP/IP protocol.
- Printer for printing reports.
- CD-ROM optical disc reader for software installation.

## 2. INSTALLATION

### 2.1. General information and recommendations

The LoggerSoft software includes a client program with a graphical user interface, hereinafter referred to as LoggerSoft, and a database management system (DBMS). The freely distributed Firebird DBMS, hereinafter Firebird, is used as a DBMS. Accordingly, the installation is performed in two stages:

1. Installing Firebird.
2. Installing LoggerSoft.

**WARNING!** It is recommended to install the programs in the following sequence: first Firebird, then LoggerSoft.

Depending on the need, both programs can be installed either on one computer or on different computers in a local network. The client program can be installed on several computers according to the number of operators.

**WARNING!** Administrator rights are required to install LoggerSoft.

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<sup>1</sup> The size of the database depends on many factors, such as the number of loggers used, the data archiving period, the data storage time, etc. After installing the LoggerSoft software, the database size will be very small, but the file will grow later. Depending on the intensity of use of the program, the database file can reach sizes much larger than indicated in this manual.

## 2.2. Overview of the installation package

The list of folders and files of the LoggerSoft installation package is presented in Figure 1, and their description is in Table 1.

Ім'я	Дата змінення	Тип	Розмір
Drivers	15.03.2023 14:30	Папка файлів	
Firebird	13.06.2017 15:23	Папка файлів	
InstallDBHelper	15.03.2023 11:57	Папка файлів	
language pack UA	16.03.2023 10:48	Папка файлів	
LS	13.06.2017 15:23	Папка файлів	
Manual	13.06.2017 15:23	Папка файлів	
autorun.inf	21.10.2010 19:06	Відомості для уст...	1 КБ
run.exe	03.02.2003 15:27	Застосунок	484 КБ
setup.bat	21.10.2010 18:35	Пакетний файл ...	1 КБ
setup.dbd	16.09.2014 17:35	Файл DBD	475 КБ
setup.txt	16.09.2014 17:23	Текстовий докум...	8 КБ
Встановлення української мови.txt	16.03.2023 10:54	Текстовий докум...	1 КБ

Figure 1. List of folders and files of the LoggerSoft installation package.

Table 1. List of folders and files of the LoggerSoft installation package.

Name	Description
Drivers	Folder with drivers
Firebird	Folder with Firebird installation files
InstallDBHelper	The folder that contains the database template and the Firebird setup wizard
LS	Folder with LoggerSoft installation files
Manual	The folder that contains the program documentation
setup.bat	A batch file that can be used to start the disk autorun interface
setup.dbd setup.txt run.exe autorun.inf	Other files necessary for the operation of the disk autorun interface

## 2.3. Installation package interface

It is preferable to perform the installation using the autorun interface of the installation package (see Figure 3). To open this interface, run the setup.bat batch file located at the root of the installation package (see Figure 1).

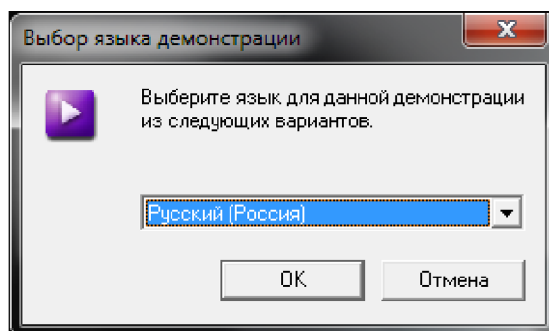


Figure 2. Interface of the disk autorun (language selection).

The autorun interface starts with language selection (see Figure 2). Select a language from the list and click the “OK” button. As a result, the main menu window will open.



Figure 3. Interface of the disk autorun (language selection).

The interface menu consists of only a few items. Their description is presented in Table 2.

Table 2. Menu of the disk autorun interface.

Name	Description
Installation	Go to the Installation submenu
Review	Open the installation package folder in Windows Explorer
Our website	Open the TERA website in the browser
Contacts	Show TERA contact details
Exit	Close the autorun interface

To start the installation, you need to select the appropriate menu item. After that, you will be transferred to the “Installation” submenu (Figure 4). This menu contains two items, each of which corresponds to one of the programs and starts the installation of this program.



Figure 4. The interface of the disk autorun (Installation submenu).

#### 2.4. Firebird

Firebird should be installed on a computer with a reliable hard drive. Database files, that is, accumulated archives, will be stored on this computer.

After starting the Firebird installation, a dialog box will appear to select the language to install (Figure 5). Select the desired language and press the “OK” button.

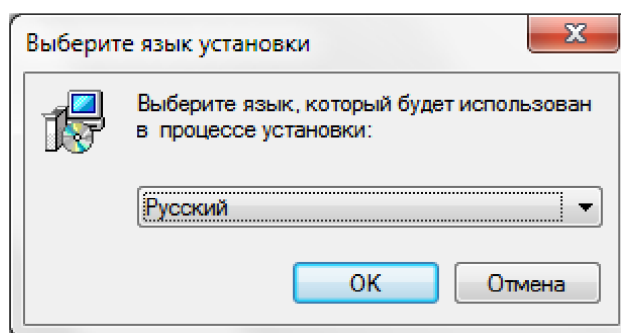


Figure 5. Installing Firebird - choosing the installation language.

Next, the installation wizard welcome window will appear (Figure 6). This is the first step of installation. Click the “Next” button.

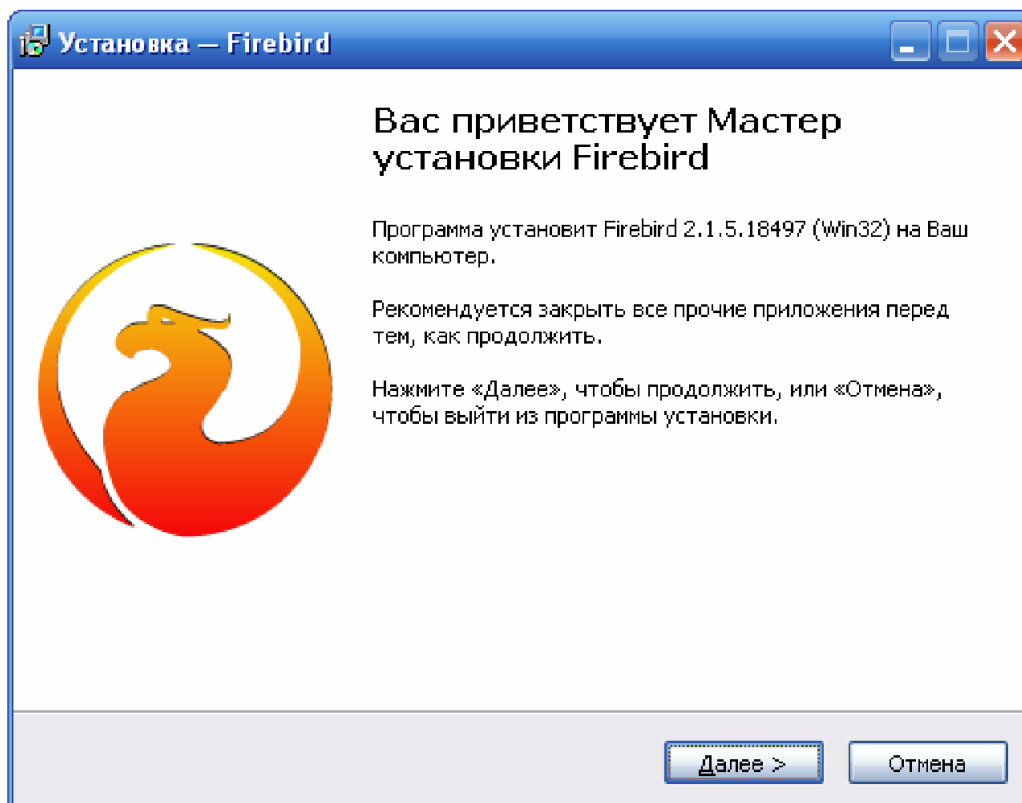


Figure 6. Installing Firebird - Step 1.

Step 2 is the license agreement (Figure 7). Select the item “I agree to the terms of the agreement”, then click the “Next” button.

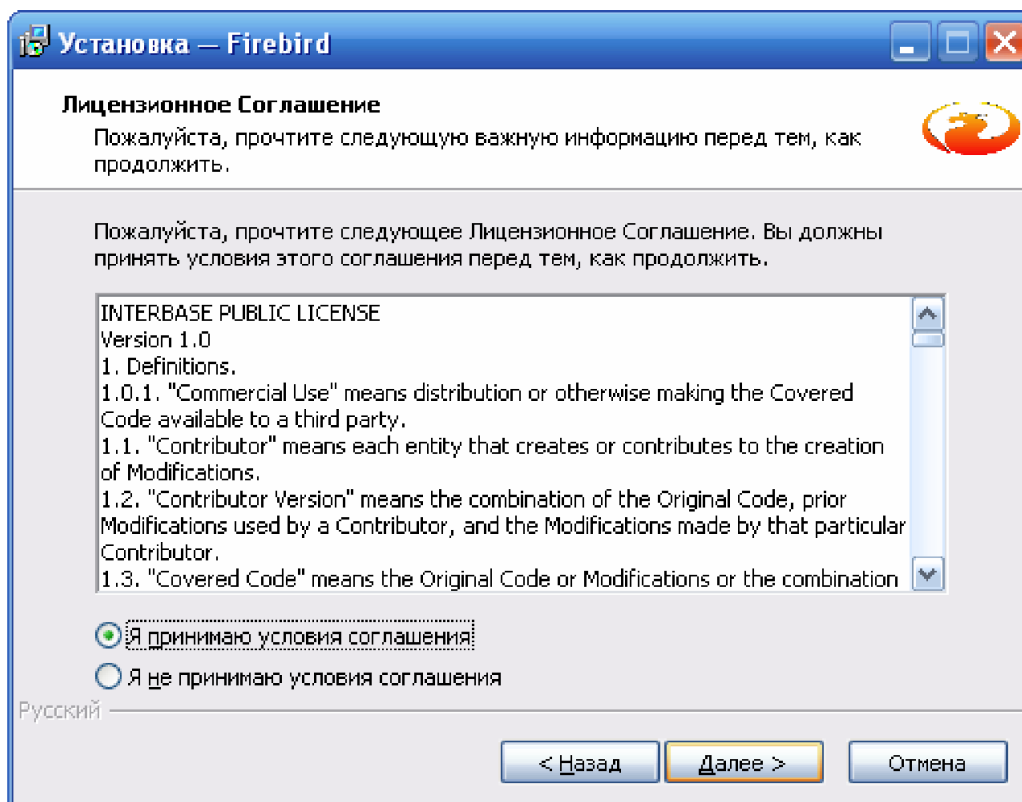


Figure 7. Installing Firebird - step 2.



Step 3 (Figure 8) provides installation information. To continue, click the “Next” button.

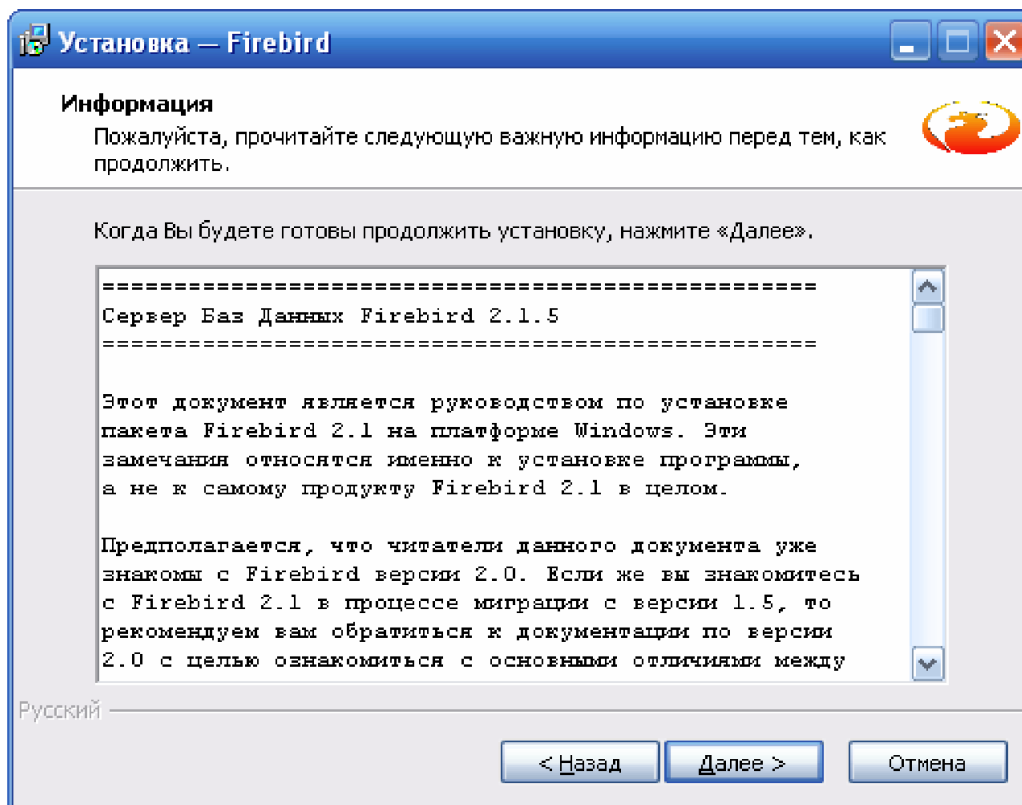


Figure 8. Installing Firebird - step 3.

The next step provides a directory selection for installation. In most cases, there is no need to change it. Just click the “Next” button.

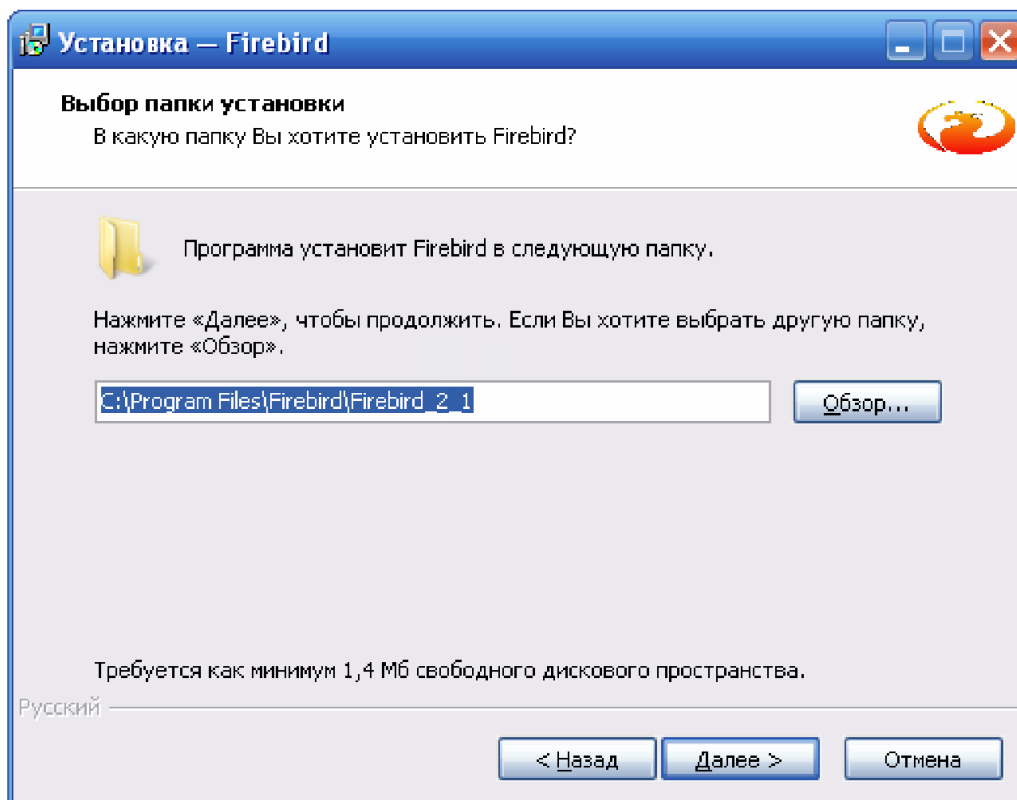


Figure 9. Installing Firebird - step 4.

The fifth step (Figure 10) prompts you to select components to install. By default, the full installation and Super Server binaries option are offered. In most cases, this is the optimal choice. However, if your computer is not connected to a local network, then it makes sense to choose the Classic Server binaries. In this case, the DBMS will work more efficiently. To proceed to the next step, click the “Next” button.

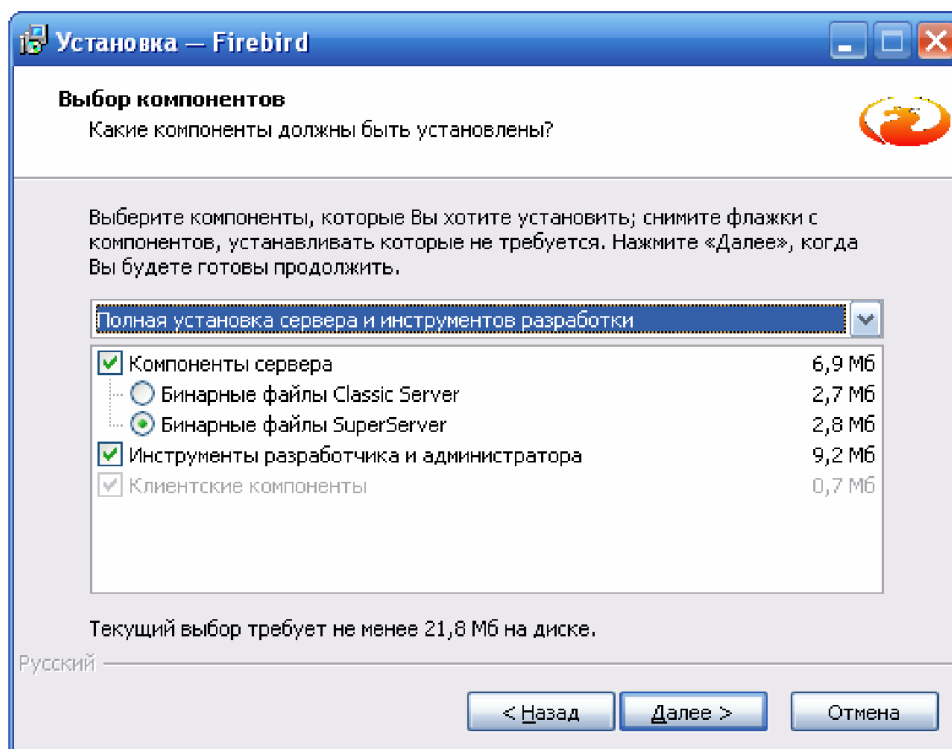


Figure 10. Installing Firebird - step 5.

Step 6 (Figure 11) allows you to select a folder in the Start menu to place the shortcuts. The name suggested by default is perfectly acceptable. Click “Next” to continue.

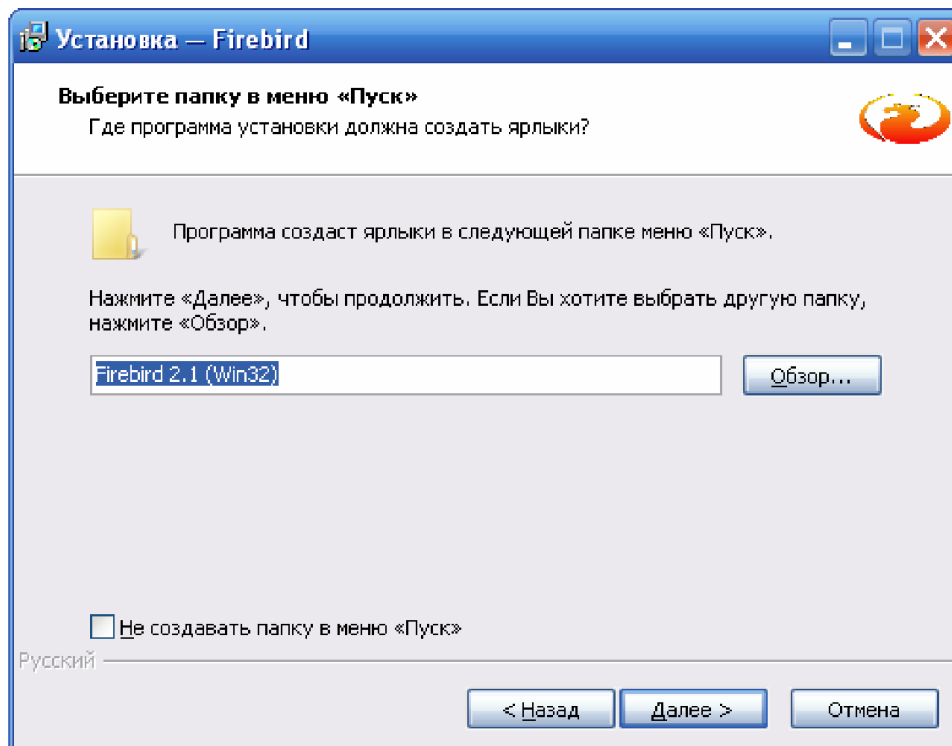


Figure 11. Installing Firebird - step 6.

Step 7 (Figure 12) - selection of additional tasks after installation. All necessary parameters are selected by default. There is no need to change them. Just click the “Next” button.

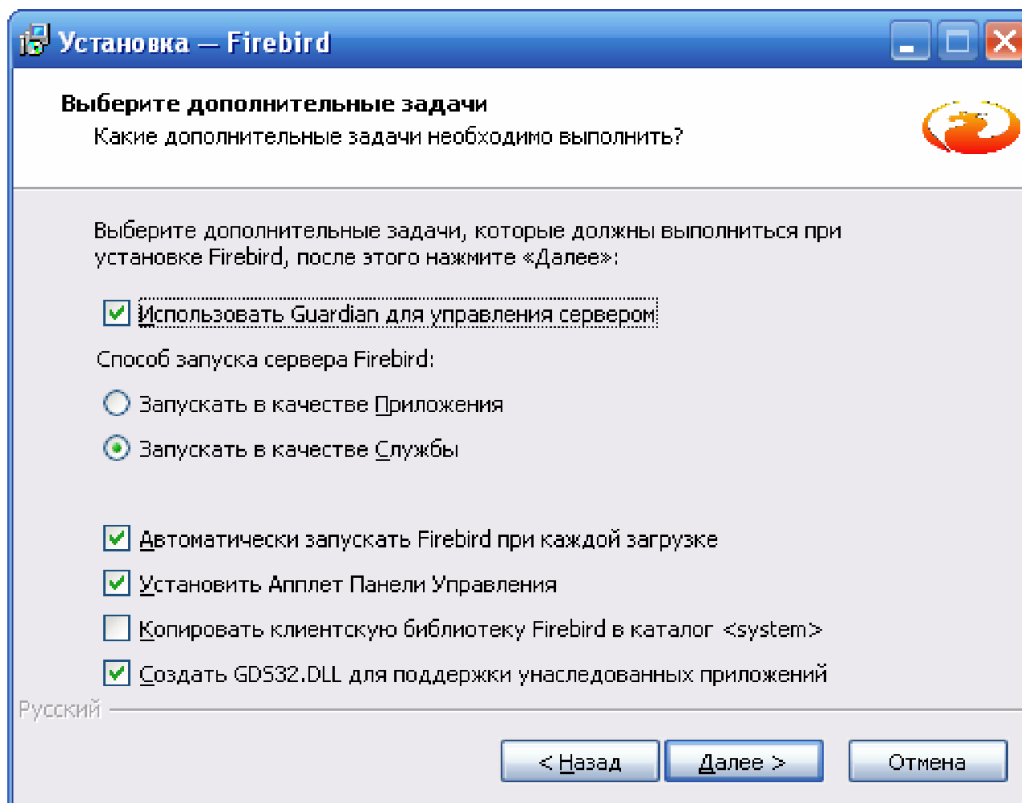


Figure 12. Installing Firebird - step 7.

Step 8 (Figure 13) is a summary page showing all selected installation options. If a mistake was made somewhere in the selection, you can go back to the relevant page and correct it. If everything is correct, then click the “Install” button to start the installation process.

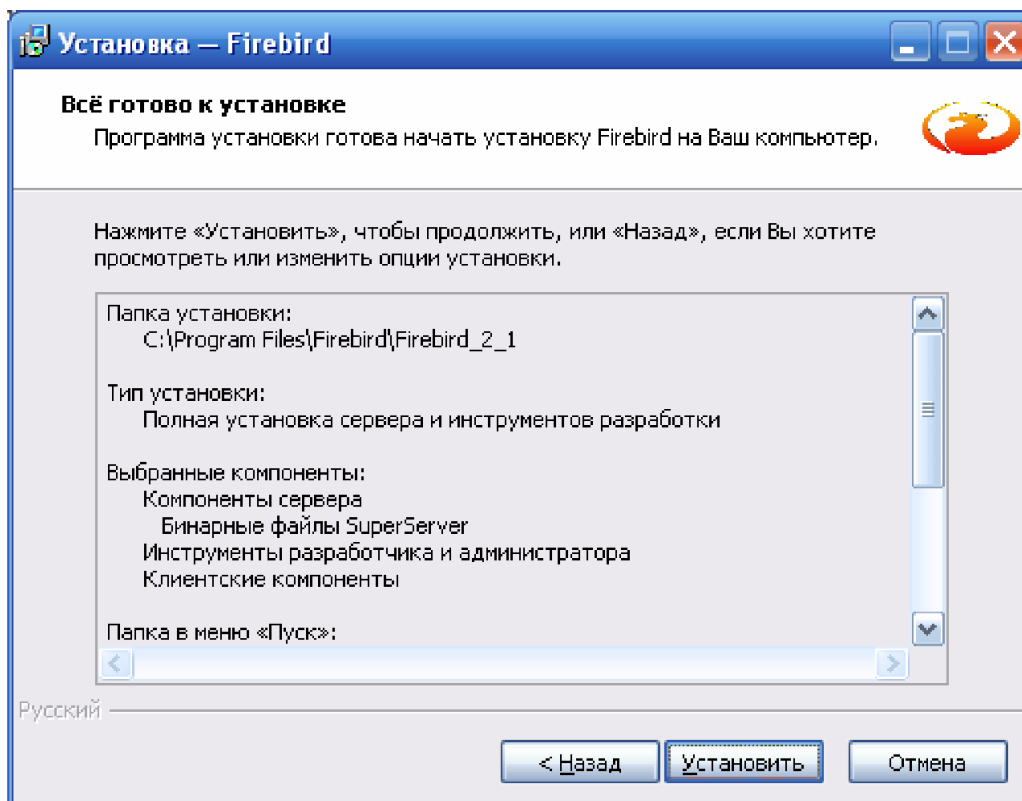


Figure 13. Installing Firebird - step 8.

Step 9 (Figure 14) offers information on how to use Firebird. To continue, click the “Next” button.

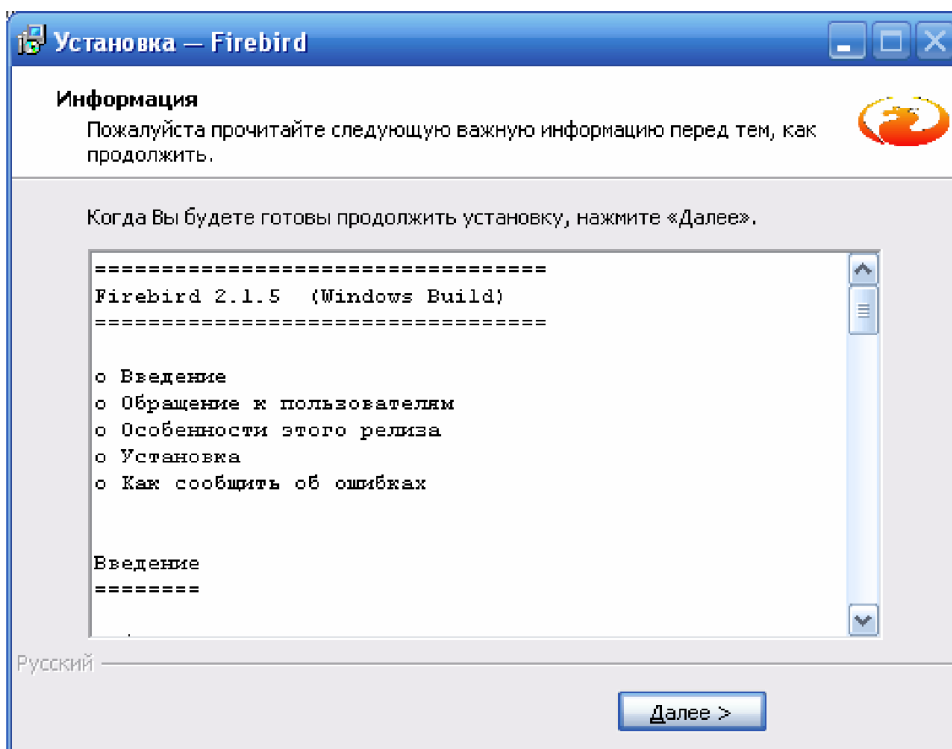


Figure 14. Installing Firebird - step 9.

Step 10 (Figure 15) is the final installation step. It displays information about the installation result and offers two tasks to complete after the wizard completes. The Firebird service should be left running, and the “After installation - What Next?” checkbox should be checked. withdraw. To complete the wizard, click the “Finish” button.

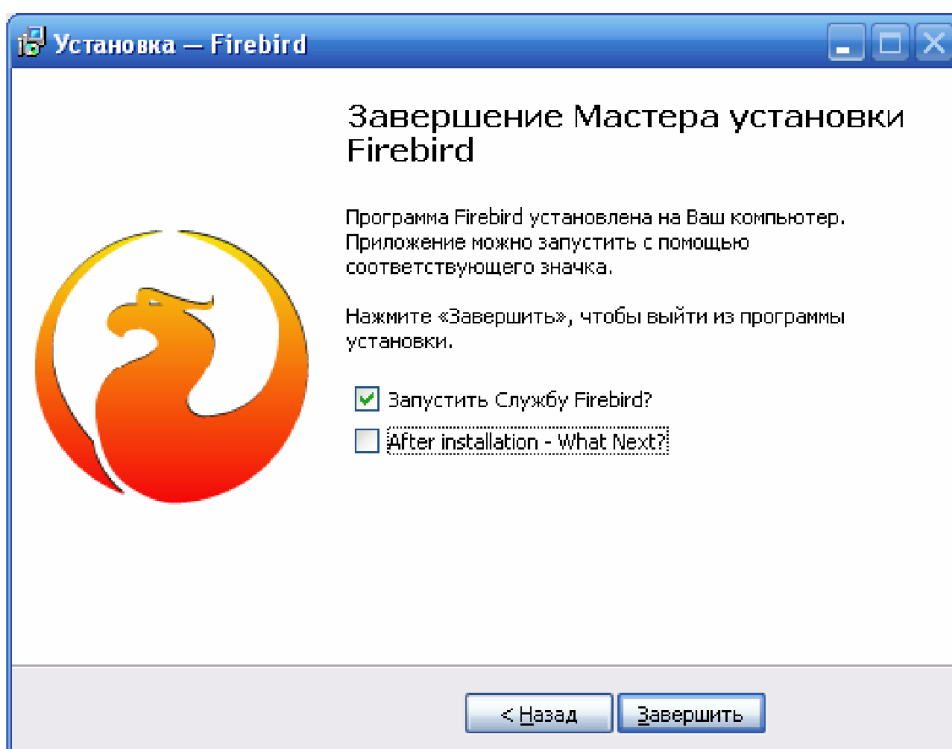


Figure 15. Installing Firebird - step 10.

This completes the Firebird DBMS installation.

## 2.5. Database Server Setup Wizard for LoggerSoft

For LoggerSoft to work, you need to create a database and configure Firebird to work with it. To facilitate this process, the program “Database server configuration wizard for LoggerSoft” is used (Figure 16). This program starts automatically after the Firebird installation is complete, if the Firebird installation was started through the disk autorun interface.

If the wizard did not start automatically, it must be started manually. To do this, open the InstallDBHelper folder at the root of the disk and execute the idh.exe file.

The wizard will create the necessary databases and configure Firebird to work with them.

The top of the wizard window shows the status of the Firebird server. If everything is fine with the server, the green indicator with the inscription “OK” will light up (Figure 16). If problems are detected in the operation of the server, the red indicator with the inscription “ERROR” will light up (Figure 17). In this case, you should pay attention to the message of the wizard and correct the server error.

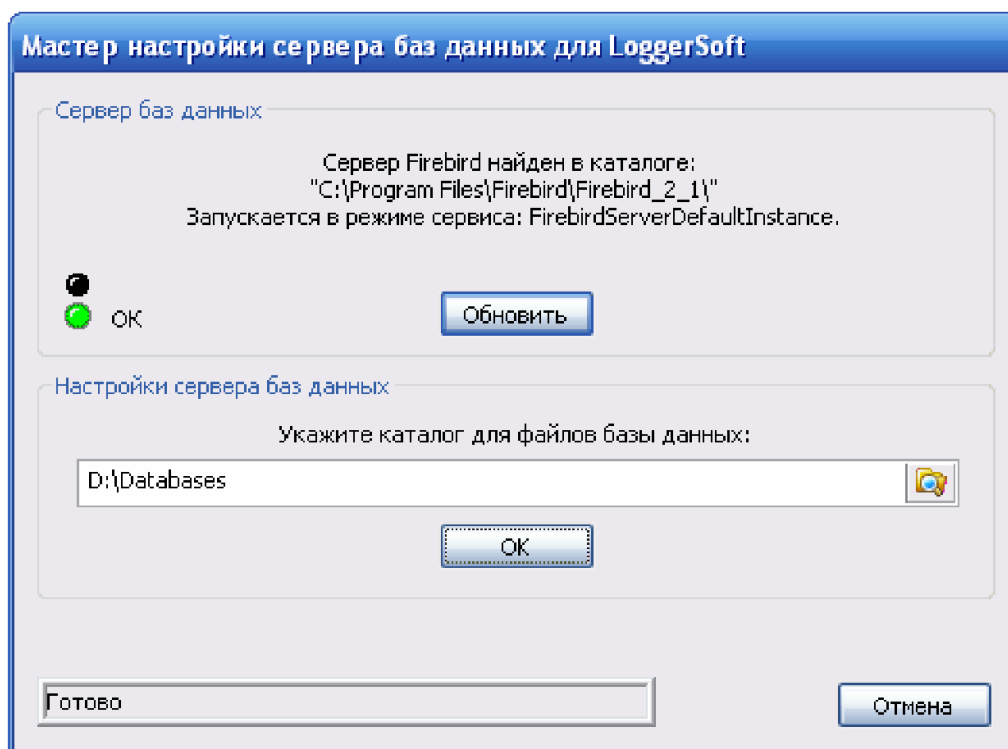


Figure 16. Database Setup Wizard for LoggerSoft.

In the central part of the wizard window, it is suggested to specify a folder for the location of database files. By default, this is the Databases folder on the D: drive. You can specify a different folder if necessary, however, it is strongly not recommended to choose a folder on the C: drive (system drive). Since in case of reinstallation of the operating system, most likely, these files will be lost.

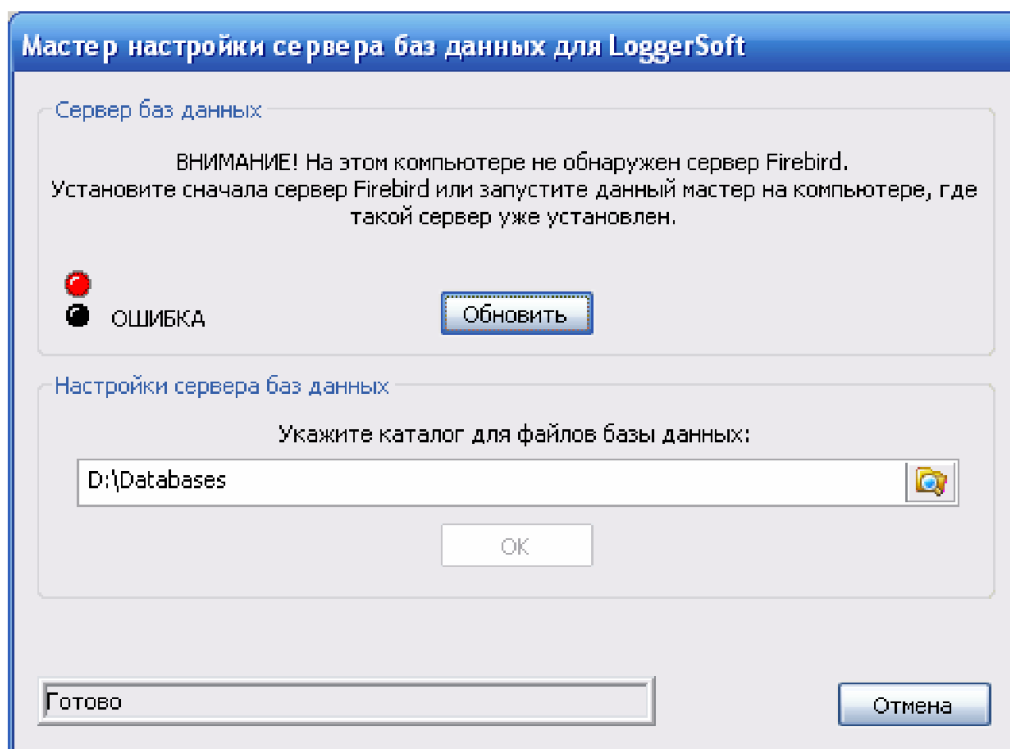


Figure 17. Database setup wizard for LoggerSoft (error).

In order for the wizard to perform all the necessary actions, you need to click the “OK” button. At the same time, the progress of the process will be displayed in the status section (lower part of the window). At the end of the work, the “Done” button will appear, clicking on which will complete the work of the wizard.

The result of the successful operation of the wizard will be the presence of the following file in the specified directory: LoggersDB.FDB - LoggerSoft database file (stores the collected archives).

## 2.6. LoggerSoft

LoggerSoft is a client program for working with a database of loggers using a convenient graphical user interface. The program is installed at the operator’s workplace.

LoggerSoft installation begins with language selection (Figure 18). Select the desired language and press the “OK” button.

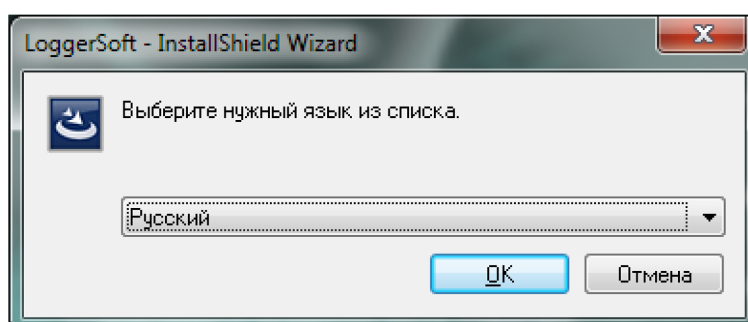


Figure 18. Installing LoggerSoft - selecting the installation language.

After selecting the language, the wizard welcome window opens (Figure 19). This is the first step of installation. Click the “Next” button.

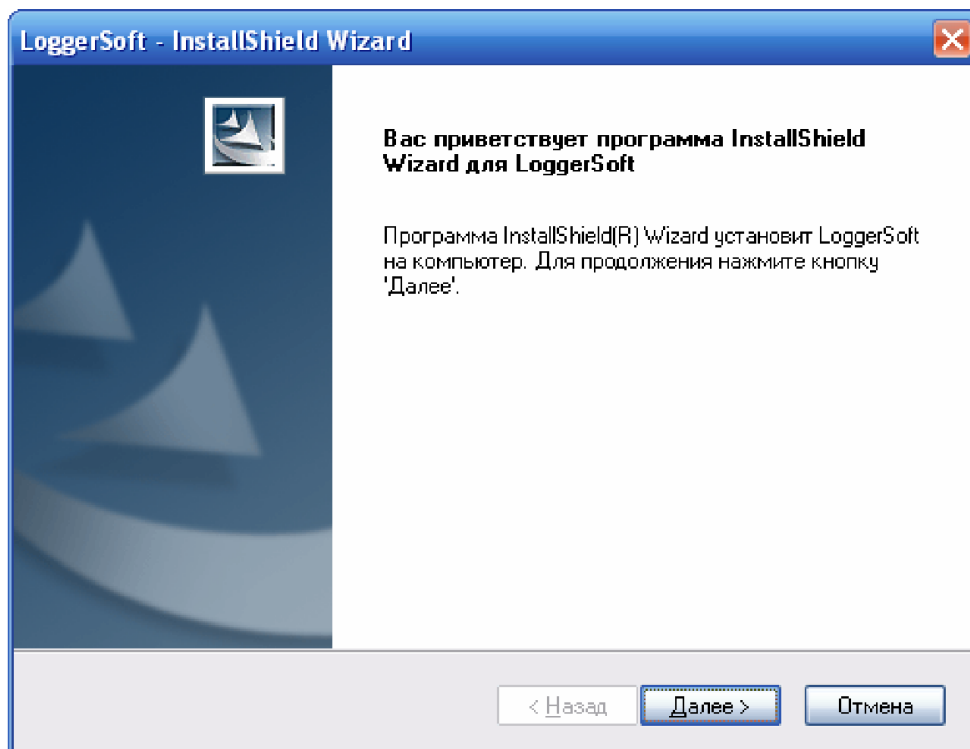


Figure 19. Installing LoggerSoft – Step 1.

Step 2 (Figure 20) - selecting the destination folder. By default, the installation will be done on the C: drive in the C:\Program Files\TERA\LoggerSoft folder. In most cases, you don't need to change the destination folder, but if you still want to do it, click the “Change...” button. To continue, click the “Next” button.

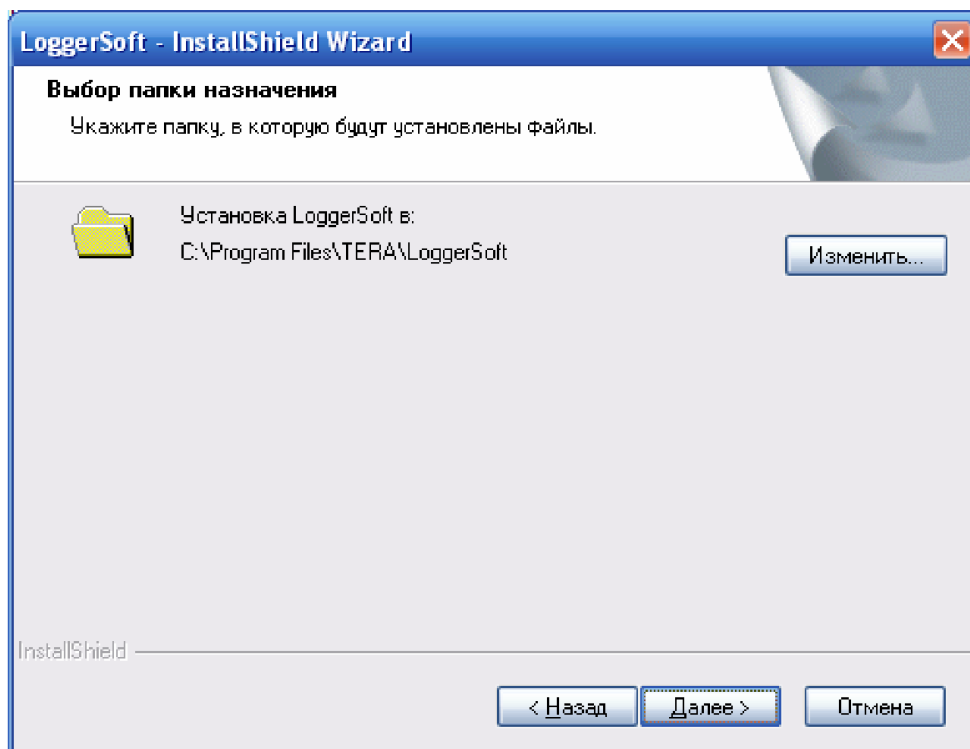


Figure 20. Installing LoggerSoft - Step 2.

Step 3 (Figure 21) - overview of selected installation options. If a mistake was made somewhere, go back to the previous step using the “Back” button and correct it. Click the “Install” button to start the installation process.

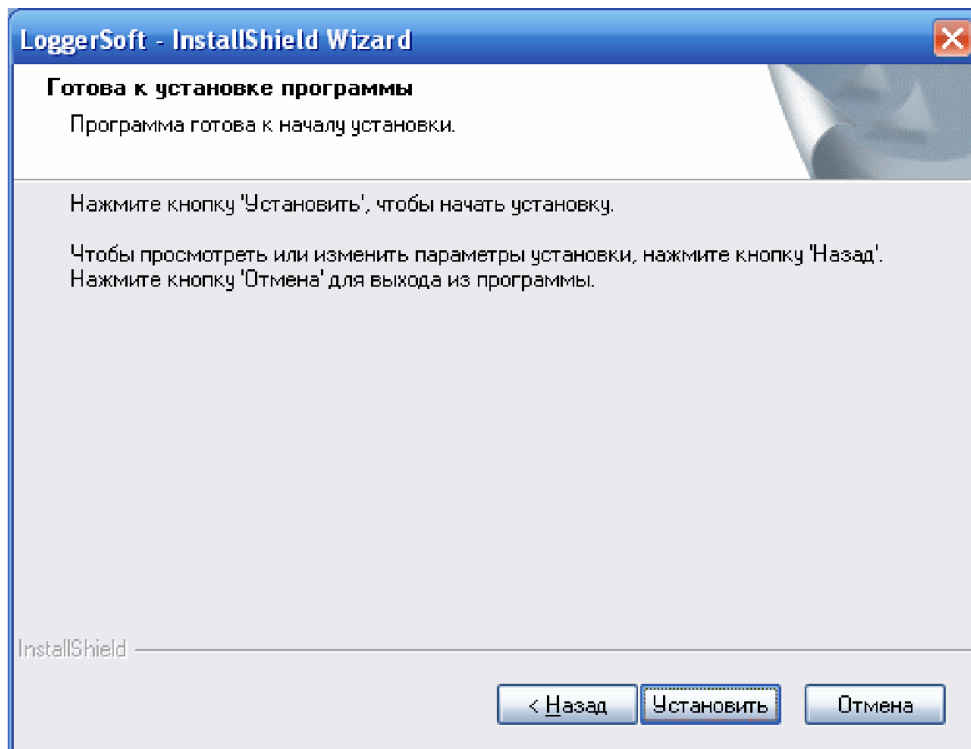


Figure 21. Installing LoggerSoft - step 3.

Step 4 (Figure 22) - displaying the installation result. Click the “Finish” button and the wizard will complete its work.

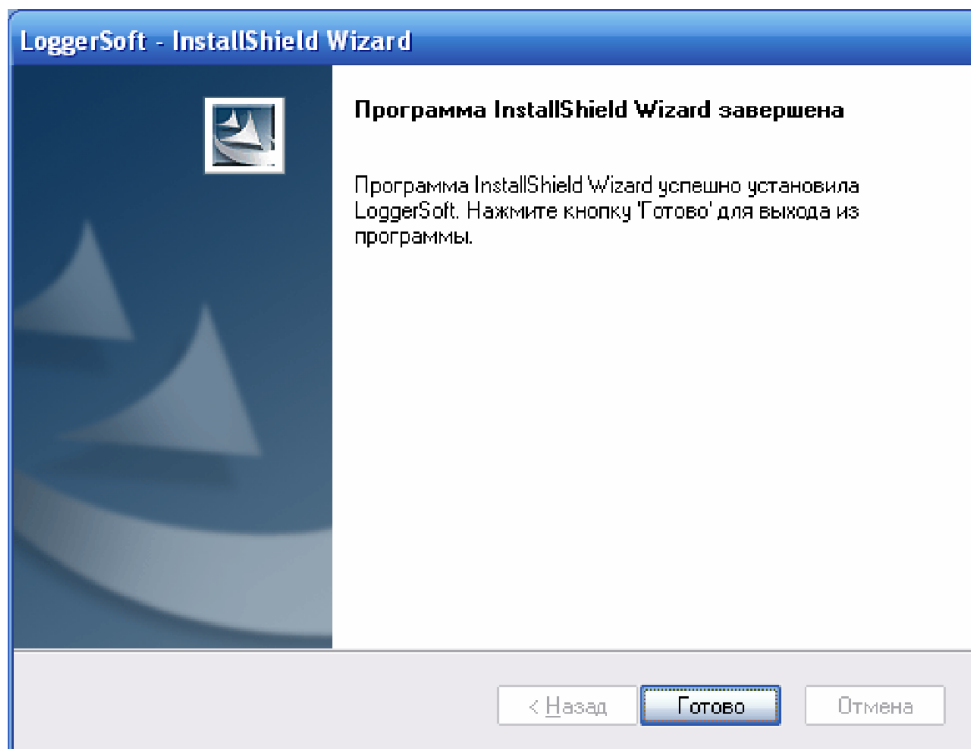


Figure 22. Installing LoggerSoft - step 4.



### 3. DESCRIPTION OF LOGGERSOFT INTERFACE

The main window of the LoggerSoft program is shown in Figure 23. It has eight main elements:

1. Main menu.
2. Standard toolbar.
3. Dockable Loggers and Labels panels.
4. Archive viewing control panel.
5. Data display area.
6. Summary panel of downloaded data.
7. Dockable Log Output panel.
8. Status bar.

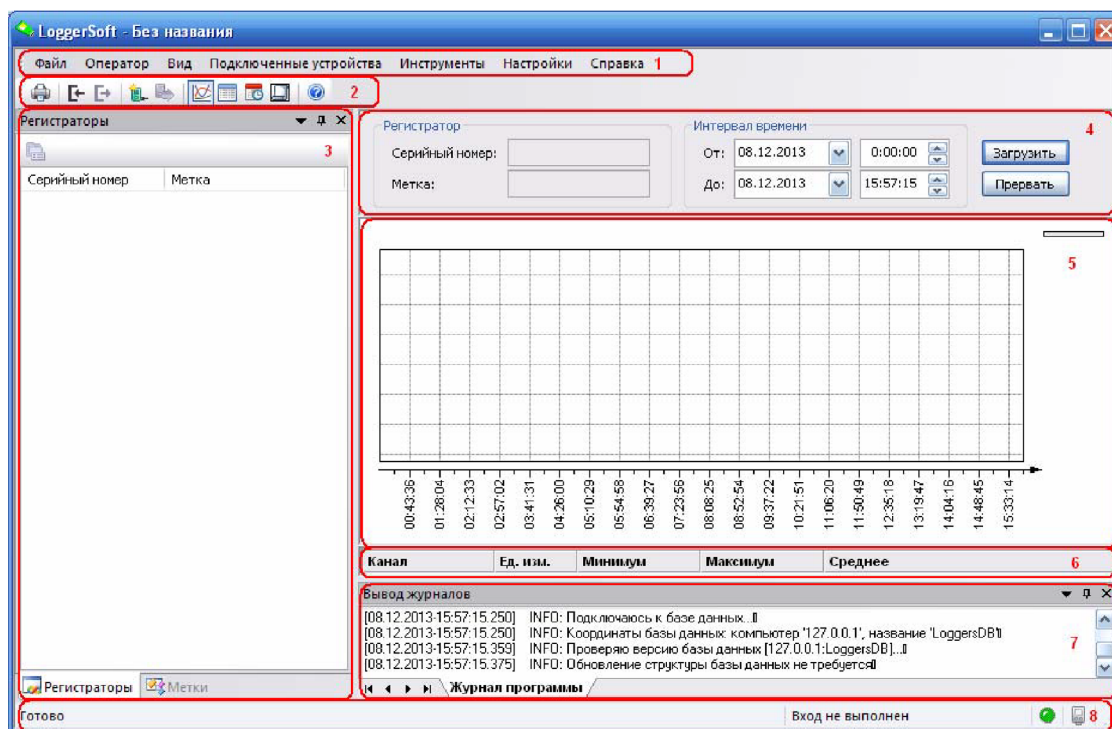


Figure 23. The main window of the LoggerSoft.

#### 3.1. Main menu

##### 3.1.1. File menu item.

Table 3. File menu commands.

Command	Description
Print...	Open the standard print dialog
Preview	Switch to the preview mode of the current document
Print settings	Open the standard friend settings dialog
Exit	Close the program

##### 3.1.2. Operator menu item.

Table 4. Operator menu commands.

Command	Description
Login	Open the user login dialog
Logout	Exit the current user from the program
Change password	Change the password of the current user

### 3.1.3. View menu item.

Table 5. View menu commands.

Command	Description
Dockable toolbars and windows	Contains a drop-down menu with a list of toolbars and dockable windows that can be hidden: <ul style="list-style-type: none"><li>• Standard</li><li>• Loggers</li><li>• Labels</li><li>• Log output</li></ul> The commands of this menu hide/open the corresponding panels or windows.
Graph	Present the data in the form of a graph
Table	Present the data in the form of a table
Logger event log	Open the logger event log
Report	Present the data in the form of a report
Status bar	Hide/unhide status bar

### 3.1.4. Connected devices menu item.

This menu changes dynamically depending on the presence of connected devices. If there are no connected devices, the menu contains the commands presented in table 6. If one device is connected, the menu is supplemented with commands from table 7. If several devices are connected at once, a drop-down menu with the commands of table 7 is created for each of them.

Table 6. Connected devices menu commands.

Command	Description
Search for connected devices	Start searching for connected devices

Table 7. Commands for working with the device.

Command	Description
Read data...	Open the dialog for reading data from the device
Settings...	Open the device settings dialog
Time synchronization	Synchronize the device and computer time
Battery replacement...	Perform the device battery replacement operation
Clock calibration...	Perform device clock calibration operation
Calibration of measurement channels...	Open the device measurement channels calibration dialog

### 3.1.5. Tools menu item.

Table 8. Tools menu commands.

Command	Description
User event log	Open the user event log
Search for connected devices	Start searching for connected devices

### 3.1.6. Settings menu item.

Table 9. Settings menu commands.

Command	Description
Database...	Open the database settings dialog
User rights...	Open the user rights administration dialog
Supported device types...	Display a list of supported device types
Language	A drop-down menu with a list of available program interface languages

### 3.1.7. Help menu item.











Table 10. Help menu commands.

Command	Description
About LoggerSoft...	Output information about the LoggerSoft program

## 3.2. Standard toolbar

The Standard toolbar duplicates some of the main menu commands for quick access. The list of these commands is given in table 11.

Table 11. List of Standard toolbar commands.

Icon	Name	Description
	Print...	Open the standard print dialog
	Login	Open the user login dialog
	Logout	Exit the current user from the program
	Search for connected devices	Start searching for connected devices
	Reading data...	Open the dialog for reading data from the device
	Graph	Present the data in the form of a graph
	Table	Present the data in the form of a table
	Logger event log	Open the logger event log
	Report	Present the data in the form of a report
	About LoggerSoft...	Output information about the LoggerSoft program

If this panel is disabled, you can open it again using the main menu command “View → Toolbars and dockable windows → Standard”.

### 3.3. Dockable Loggers and Labels panels

Both of these panels display a list of loggers whose information is available in the database, but with different sorting methods. If the Loggers panel is focused on sorting and searching for loggers by serial number, the Labels panel is designed to display loggers sorted by their text label. Both panels display both the serial number and the text label of the loggers in separate columns. The columns have headers, which can be clicked to change the sorting direction.

If these panels are disabled, you can open them again using the main menu command “View → Toolbars and dockable windows → Loggers/Labels”.

To select a logger to view its archives, double-click the left mouse button on the logger in the list of any of these panels. At the same time, the data of the selected logger will appear on the control panel of the archive view.

If you right-click on an item in the list, the context menu for this item will open. In the context of these panels, the context menu of the logger and the context menu of the text label are distinguished.

#### 3.3.1. Logger context menu.

This context menu appears when you right-click on the logger element in the “Label” panel and in the “Loggers” panel. The list of commands of this menu is given in table 12.

Table 12. Logger context menu commands.

Command	Description
Read data...	Open the dialog for reading data from the device
Settings...	Open the device settings dialog
Time synchronization	Synchronize the device and computer time
List of logical parameters...	Open a window with a list of logical parameters of this device
Battery replacement...	Perform the device battery replacement operation
Clock calibration...	Perform device clock calibration operation
Calibration of measurement channels...	Open the device measurement channels calibration dialog
Delete	Delete the selected logger from the database. <b>Note:</b> You cannot delete a logger that is currently connected to the computer

#### 3.3.2. Text label context menu.

This context menu appears when you right-click on the text label element in the Label panel. The list of commands of this menu is given in table 13.

Table 13. Text label context menu commands.

Command	Description
Create	Create a new text label
Delete	Delete the selected text label from the database. <b>Note:</b> You cannot delete a label that is associated with a logger. And it is also not possible to delete the element “<Without label>”.

### 3.4. Archive viewing control panel

This panel is designed to manage viewing of the archive, that is, data that is already in the database. An example of the panel is presented in Figure 24.

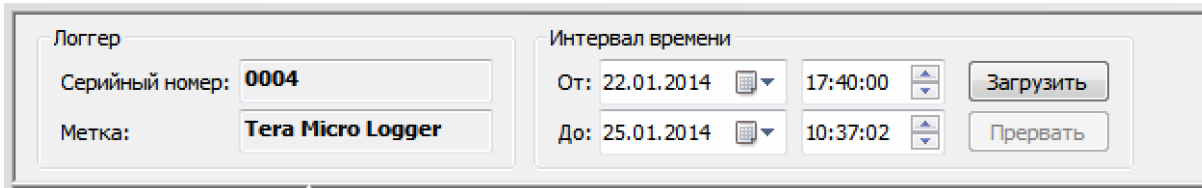


Figure 24. Archive viewing control panel.

The “Logger” section displays information about the logger selected for viewing, namely: the serial number and text label of the logger.

In the “Time interval” section there are controls for choosing the time interval for which you want to view the data.

The “Download” button initiates the process of downloading data for the specified time interval from the database. At the same time, both the archive data and the event log of the selected logger are loaded. The download process is displayed in the status bar. When the download process is complete, the data will be displayed in the data display area in the form that is currently selected.

The “Interrupt” button allows you to interrupt the data download process.

### 3.5. Data display area

This is a window that displays the data loaded from the database. Such data can be presented in several ways, namely: in the form of a graph, table or report. Also, this window displays the log of logger events. The selection of the type of presentation of information is carried out using the commands of the main menu “View”, or using the buttons of the “Standard” toolbar.

#### 3.5.1. Graph.

The graph shows the trend of parameter changes over the specified time. An example of the graph is shown in Figure 25.

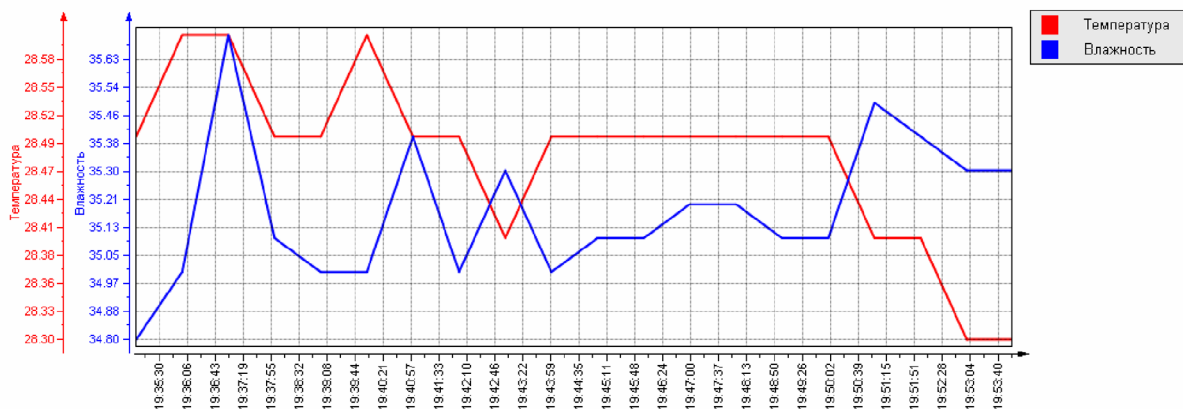


Figure 25. An example of a graph.

In the field of conditional designations, the names of the logical parameters of the logger are shown with reference to the color of the pen, which is used to draw the graph of this parameter. If you move the mouse pointer over the convention area, a pop-up button “>>” will appear, clicking on which opens the channel display switches. If you remove the switch, the graph of this channel will not be displayed (see Figure

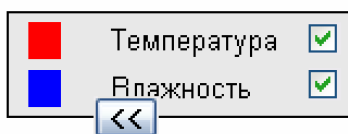


Figure 26. Area of conventional designations.

There is always one X-axis on the graph - the time axis. There can be several value axes, depending on the number of different measurement units used by the logger.

Each value axis can operate in auto-scaling or fixed-scale mode. By default, the auto-scaling mode is used. To change the scale of an axis, you need to hold down the left mouse button on it and, without releasing the button, drag the pointer up or down, and then release the button. If you drag it up, the scale will increase. If you drag down, the scale will decrease. To return the axis to the auto-scaling mode, you need to move the mouse pointer to this axis and click on the pop-up button “Auto-Scale”.

It is also possible to enlarge any part of the graphic for a more detailed examination. You can do this with the mouse. You need to press the left mouse button in the upper left corner of the area you are interested in, and, without releasing the button, stretch the frame from left to right, and then release the button. After that, the area that fell into the frame area will be stretched over the entire graphic area. If you stretch the frame from right to left, the scale will be reduced. In addition, there is an option to change the scale using the mouse wheel (third mouse button).

You can move the graph with the right mouse button. At the same time, if the cursor is over the graph area, the displacement will occur along all axes simultaneously. If the cursor is over a specific axis, then the shift will occur only along this axis.

After any manipulations of moving the graph or changing the scale along the X axis, the “Restore” button will appear in the lower part of the graph, by clicking on which you can return to the original position. That is, restore the scale on all axes.



Figure 27. Time axis context menu.

The format of the inscriptions on the time axis can be changed in such a way that they are as informative as possible. To do this, call the context menu above the time axis with the right mouse button and select the required format (see Figure 27).

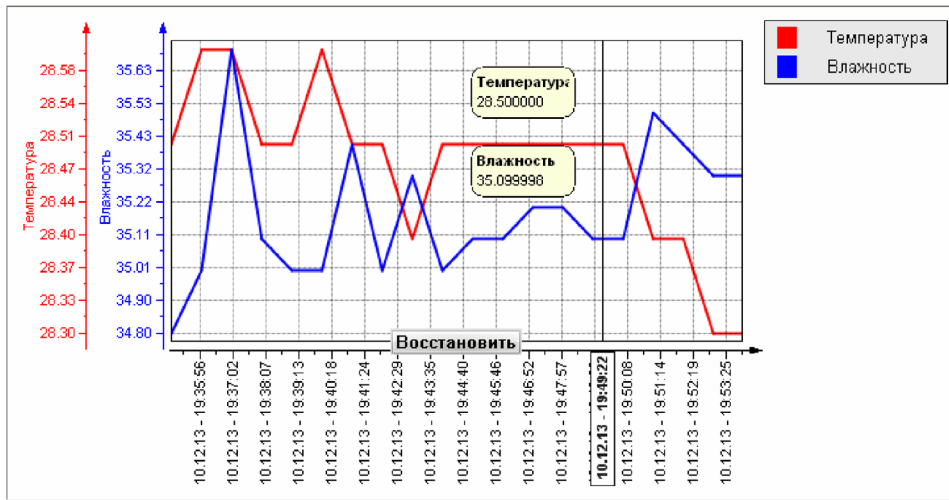


Figure 28. Cursor on the graph.

For detailed data analysis, it is possible to set the cursor (Figure 28). This is done by double-clicking on the graph area. The cursor is a vertical line with a time stamp and windows showing the values for each channel at that time. Value windows can be moved with the mouse.

You can move the cursor left/right with the mouse. To remove the cursor, you need to call up the context menu above it and select the “Remove Cursor” item.

### 3.5.2. Table.

Presentation of information in the form of a table also allows you to monitor the trend of changing parameters, but in numerical form.

The columns of the table are the measurement channels of the logger, and the rows are the values of these parameters at a certain point in time. The left column shows the timestamps of each line. The names of the logical parameters and their measurement units are indicated in the column headings. An example of the table is presented in Figure 29.

Дата, время	Температура, °С	Влажность, %
10.12.2013 19:31:00	28.50	34.60
10.12.2013 19:31:15	28.50	34.60
10.12.2013 19:31:30	28.60	34.80
10.12.2013 19:31:45	28.50	34.70
10.12.2013 19:32:00	28.50	34.70
10.12.2013 19:32:15	28.50	34.80
10.12.2013 19:32:30	28.50	34.80
10.12.2013 19:32:45	28.50	34.90

Figure 29. An example of a table.

This table can be exported to a file (see “Export data”).

### 3.5.3. Logger event log.

The log of events of the logger allows you to answer some questions in case of situations when neither a graph nor a table can give a complete picture of what is happening. Also, the event log can provide explanations in case of failures. If you need to know the exact time of a certain event, then you need a time stamp of the events. The right column contains a text description of the events.

An example of the event log is shown in Figure 30. The list of events is provided in the form of a table. The table has two columns. The left column shows the time stamps of the events. The right column contains a text description of the event.

Дата, время	Описание события
23.01.2014 18:14:07	Настройка логгера
23.01.2014 18:14:07	Запуск архивирования с таймером вкл. сигнализации
23.01.2014 18:24:10	Включение аварийной сигнализации

Figure 30. Example of an event log.

This table can be exported to a file (see “Export data”).

### 3.5.4. Report.

Viewing the report allows you to evaluate the appearance and content of the report before printing. If necessary, the appearance can be slightly adjusted. An example of the report is shown in Figure 31. The report consists of a header, a table of summary information, a table with archive data and graphics. The header of the report indicates the text label and serial number of the logger, the beginning and end of the reporting interval, as well as the archiving period.

When viewing the report, an additional panel “Report parameters” opens. It is located to the left of the report. The panel has controls for changing the appearance of the report.

The “Page Options...” button opens a dialog for editing report page options (see Figure 32).

The “Include in Report” section contains switches that enable/disable the display of certain report elements. Such elements are a table with archive data, an event log, and a graph.

The “Channels” section contains a list of switches with which you can enable/disable the reporting of individual measurement channels of the logger.

--- Страница 1 из 129 ---

**Отчет**

Метка логгера: Teta Micro Logger  
 Серийный номер: 0004  
 Начало отчетного интервала: 22.01.2014 17:40:00  
 Окончание отчетного интервала: 25.01.2014 10:37:02  
 Период архивирования: 5 минут

Канал	Ед.изм.	Минимум	Максимум	Среднее
Температура	°C	20.30	28.50	22.53
Влажность	%	---	---	---

**Таблица**

Дата	Время	Темпера	Влажност
22.01.2014	17:55:40	25.60	неис
22.01.2014	17:55:50	25.60	неис
22.01.2014	17:56:00	25.60	неис
22.01.2014	17:56:10	25.60	неис
22.01.2014	17:56:20	25.60	неис
22.01.2014	17:56:30	25.60	неис
22.01.2014	17:56:40	25.60	неис
22.01.2014	17:56:50	25.60	неис
22.01.2014	17:57:00	25.60	неис
22.01.2014	17:57:10	25.60	неис
22.01.2014	17:57:20	25.60	неис
22.01.2014	17:57:30	25.60	неис
22.01.2014	17:57:40	25.60	неис

Дата	Время	Темпера	Влажност
22.01.2014	18:04:00	24.80	неис
22.01.2014	18:04:10	24.80	неис
22.01.2014	18:04:20	24.80	неис
22.01.2014	18:04:30	24.90	неис
22.01.2014	18:04:40	24.90	неис
22.01.2014	18:04:50	24.90	неис
22.01.2014	18:05:00	24.90	неис
22.01.2014	18:05:10	24.90	неис
22.01.2014	18:05:20	24.90	неис
22.01.2014	18:05:30	24.90	неис
22.01.2014	18:05:40	24.90	неис
22.01.2014	18:05:50	24.90	неис
22.01.2014	18:06:00	24.90	неис

Панель параметров (слева):  
 Параметры страницы...  
 Включить в отчет:  
 Таблица  
 Журнал событий  
 График  
 Каналы:  
 Температура  
 Влажность

Figure 31. An example of a report.



The “Page Options” dialog (Figure 32) allows you to change the orientation of the sheet and fields of the report page.

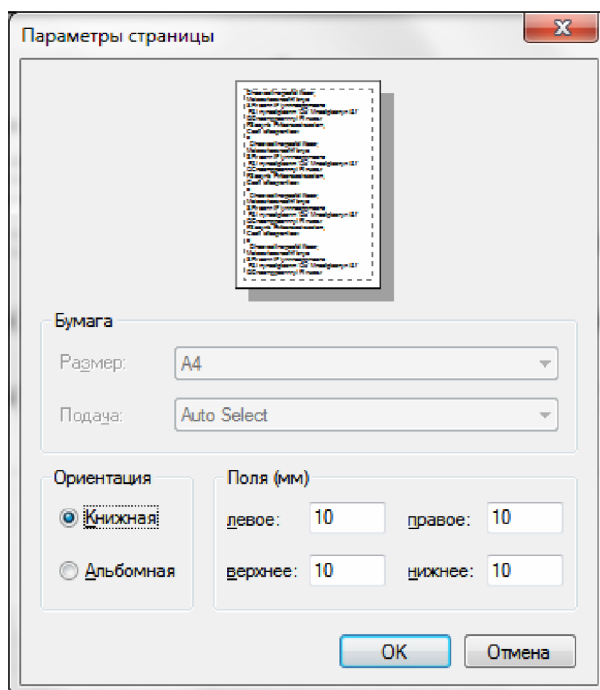


Figure 32. Page parameters.

### 3.6. Summary panel of downloaded data

This panel (see example on page 33) is present on the screen if the graph, table or event log view is selected to display the data. If the presentation of information in the form of a report is selected, then this panel is hidden. The panel presents information in the form of a summary table based on the data currently loaded from the database. The rows of the table are the measurement channels of the selected logger. The columns indicate: units of measurement, minimum, maximum and average value.

Канал	Ед. изм.	Минимум	Максимум	Среднее
Температура	°C	28.5	28.6	28.5125
Влажность	%	34.6	34.9	34.7375

Figure 33. Summary panel of downloaded data.

### 3.7. Dockable Log Output panel

This panel displays the application log. It is a magazine that runs programs during its work. It is a text file located in the program folder. Recording to the file is duplicated by output to the screen.

Application logs can be useful for analyzing the causes of errors or the results of user actions. It contains details of operations performed by the user.

If this panel is disabled, you can open it again using the main menu command “View → Toolbars and dockable windows → Log output”.

### 3.8. Status bar

The status bar is located at the bottom of the program window and contains information about the program’s status. The status bar is divided into several sections (from left to right):

- Current status or a hint about a menu command.
- A progress indicator for certain long-term actions.
- The name of the current user.
- Database connection indicator.
- Indicator of presence of connected devices.

Depending on the specific situation, other information may be additionally displayed in the status bar. Hovering over individual sections of the status bar will display tooltips with more detailed information. If there is no connection to the database, then double-clicking the left mouse button on the connection indicator attempts to restore the connection.

Double-clicking the left mouse button on the section of the indicator of the presence of connected devices brings up a dialog box with a list of connected devices.

If the status bar is disabled, you can enable it using the main menu command “View → Status bar”.

## 4. WORKING WITH THE LOGGERSOFT

### 4.1. Launching the program

To start the LoggerSoft program, you can use the desktop shortcut “LoggerSoft” or the command menu “Start → All Programs → TERA → LoggerSoft → LoggerSoft”. After starting, the main program window will open (see Figure 23).

At first launch, the program may issue a message that it is unable to connect to the database. At the same time, the database connection indicator will be red in the status bar. This situation can arise in two cases. First, if the database (Firebird) is on the same computer as the LoggerSoft program, but it is not yet installed, configured, or running. In this case, you need to install, configure or start Firebird (see “Firebird” and “LoggerSoft Database Server Setup Wizard”). Second, if the database is on another computer. In this case, you should check and change the database settings (see the “Database” section). As soon as the connection to the database is restored, the indicator in the status bar will change color to green and the list of loggers that are in the database will be loaded.

The program is ready to work. You can perform a number of actions that do not require authorization, such as: searching for connected devices, reading data from the logger, viewing the archive, printing reports, viewing the current settings of the logger. To perform other actions, such as changing the logger or program settings, deleting loggers from the database, etc., you need to log in to the program (see the “User Login/Logout” section).

### 4.2. User Login/Logout

To enter the program, you need to execute the main menu command “Operator → Login”. This command opens the authorization dialog, which is shown in Figure 34. In the dialog, you need to enter your login (or user name) and password, and then click the “Login” button. If the data is entered correctly, the dialog will close, and the user name under which the login was performed will appear in the status bar.

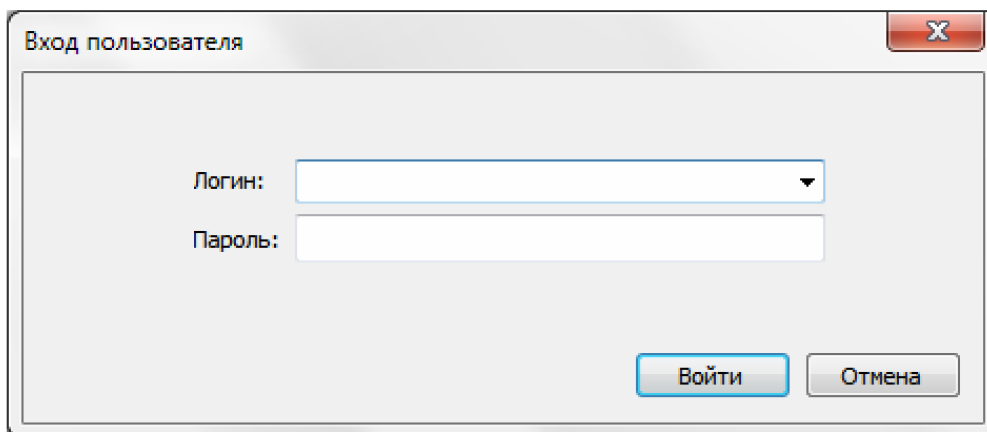


Figure 34. “User login” dialog.

The “Login” field in the dialog is made in the form of a drop-down list. This allows you to enter a username from the keyboard or select it from a list. The list contains all users that are in the database. When entering from the keyboard, the user’s name is automatically substituted in the input field, the first characters of which match the entered ones.

**NOTE.** After installing the program, there is only one user - “Administrator”. The default password for this user is set. This user is used to administer user rights and program settings.

**WARNING!** It is strongly recommended to change the password of the “Administrator” user to avoid unauthorized access to the database and malicious actions that may be performed even unintentionally.

To exit the program, execute the main menu command “Operator → Exit”. After executing this command, the message “Login failed” will appear in the status line of the program.

### 4.3. Changing the user’s password

Any user can change their password on their own. In addition, the password of any user can be changed by a user with rights to administer user rights (see the section “Administration of user rights”).

To change your password, the user must log in to the program and execute the main menu command “Operator → Change password”. In response, the “Authorization confirmation” dialog will open, an example of which is shown in Figure 35. In this dialog, you need to enter the current password to make sure that the user who logged in to the program is at the computer. After entering the password, click the “OK” button. If the entered password is correct, the dialog will close.

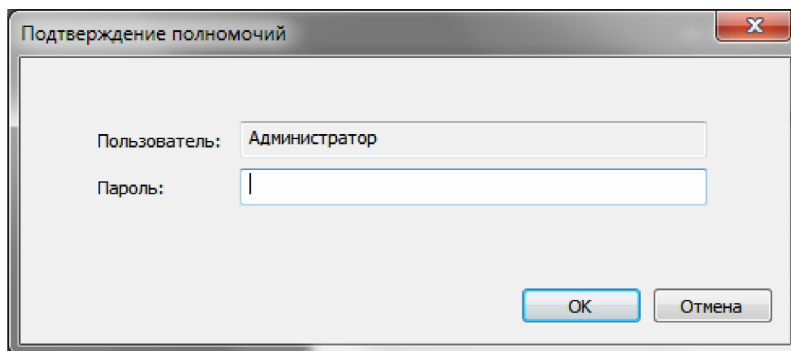


Figure 35. Authorization confirmation dialog.

If the user’s credentials are successfully confirmed, the “Set password” dialog will open. This dialog is shown in Figure 36.

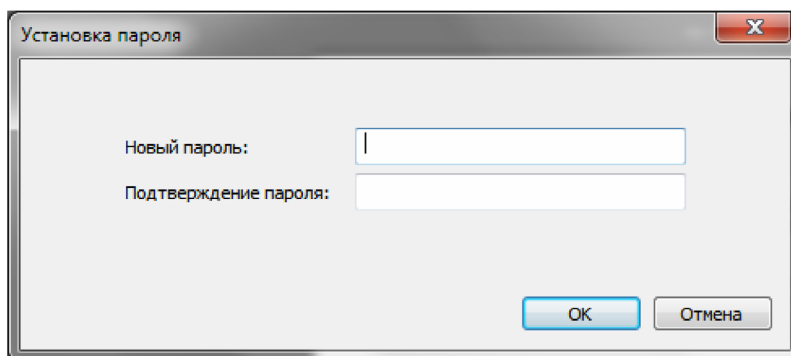


Figure 36. Set password dialog.

In the “Set password” dialog, you must enter the new password twice and click the “OK” button. If the entered passwords match, the dialog will be closed and a message about the successful password change will appear.

#### 4.4. Search for connected devices

To configure the logger or read archive data from it, you need to establish a connection with it and synchronize it with the database. To do this, you need to connect the logger to the computer and execute the “Search for connected devices” command. Since this command is used often, it is duplicated in several places.

- In the main menu Connected devices.
- In the main menu Tools.
- On the Standard toolbar.

When selecting the “Search for connected devices” command, the program starts scanning for all COM ports in the system to determine the presence of connected loggers. If the connection with the logger is established, its main parameters are read. The program will inform about the progress of the search process using a message. Since the search is carried out immediately on all ports, three options for different messages are possible.

If no connected devices are detected, the program will issue a message as shown in Figure 37.

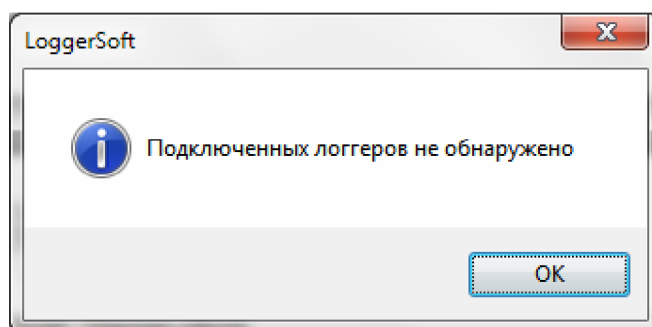


Figure 37. Message about the search result. No device detected.

If a connection is established with one logger, the program will issue a message, an example of which is shown in Figure 38.

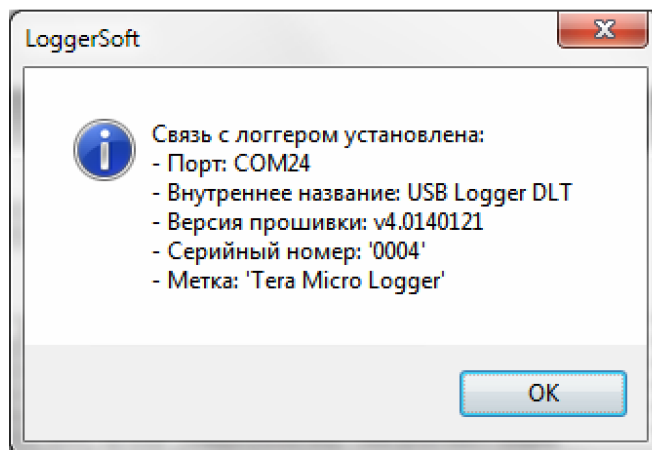


Figure 38. Message about the search result. One device detected.

If several devices are connected at once, the program will issue a message, an example of which is shown in Figure 39.

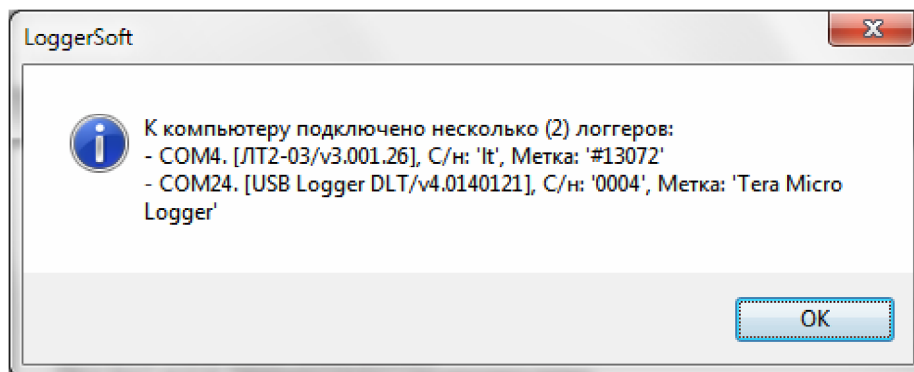


Figure 39. Message about the search result. Multiple devices detected.

After the connection with the logger is established, the program synchronizes this logger with the database. The progress of this process is also displayed in the status bar and in the application log window. In case of any errors, the program will issue a message with a description of the error.

After synchronization with the database, the current settings and time of the logger are read. If the time of the logger differs from the time of the computer by more than 5 minutes, the program will issue a request for time synchronization. The message will indicate the current time of the logger and the deviation from the computer time. An example of the request is shown in Figure 40. If you click the “Yes” button, the time synchronization will be performed immediately. If you click the “No” button, the work will continue without time synchronization. In any case, time synchronization can be performed later using a special command (see “Time synchronization” section).

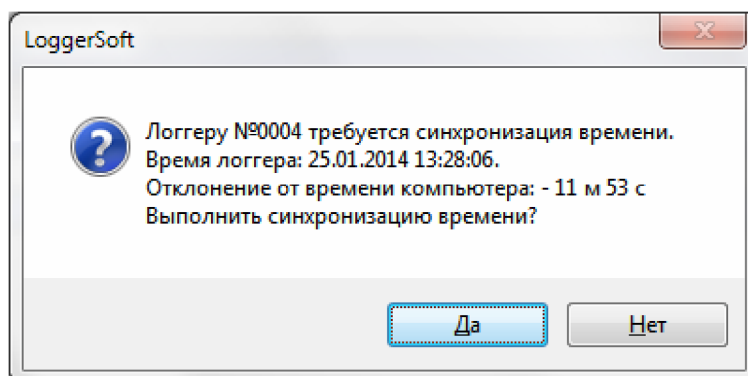





Figure 40. Logger time synchronization request.

Upon completion of all the actions described above, the main “Connected devices” menu will change, the indicator of the presence of connected devices in the status bar will change, and the color of the logger icon on the “Loggers” and “Tags” panels will change.

If the connection is established with several devices, then for each of them in the main menu “Connected devices” a drop-down menu will appear called: “Logger #N”, where N is the serial number of the logger. If there is only one device connected, the name of the “Connected devices” menu will change to “Logger #N”, where N is the serial number of the logger. If there were errors when synchronizing with the database, some commands in the logger menu will be unavailable.

Depending on the search results, the indicator of the presence of connected devices in the status bar will either turn gray  (no connected devices) or green (one  /  several devices are connected).

On the “Loggers” and “Tags” panels, the icon color of the loggers with which the connection is established and which are synchronized with the database will also change to green. If there were errors when synchronizing with the database, the color of the icon will remain blue.

#### 4.5. List of connected devices and selection of the current device

If several devices are connected at the same time, one of them is the current one. All operations that are performed without specifying a specific target device are performed with respect to the current device. An example of such an operation is reading data from the logger, launched using the appropriate button on the “Standard” toolbar.

To view the list of connected devices and the current device or to select another current device, double-click the left mouse button on the indicator of the presence of connected devices in the status bar. As a result, a dialog will open with a list of connected devices (see Figure 41).

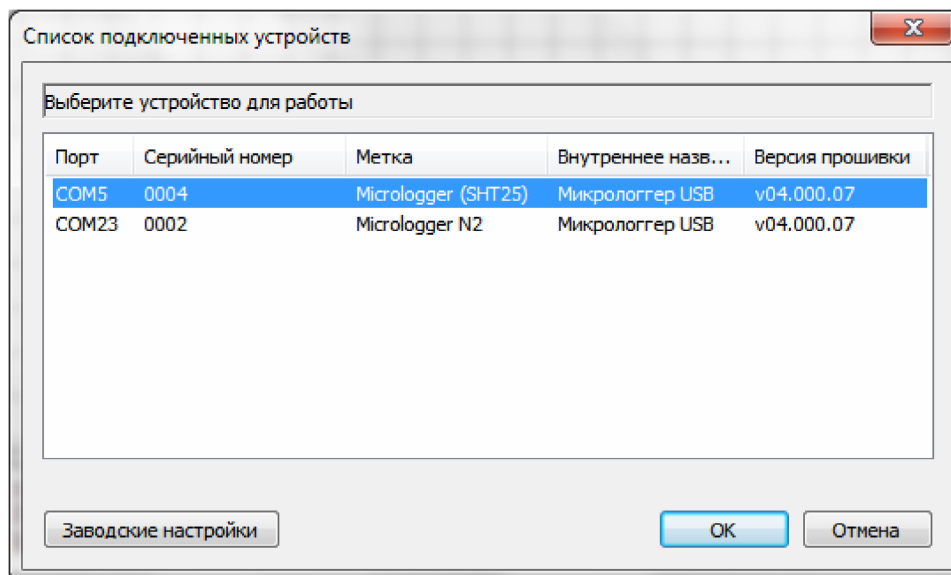


Figure 41. List of connected devices.

The current device is highlighted in color in the dialog. To change the current device, select another device in the list and press the “OK” button. As a result, the dialog will close and the current device will change.

If the program is logged in on behalf of a user who has the rights to perform a factory reset, then the “Factory settings” button will also be available in the dialog.

#### 4.6. Reading the archive from the logger

The command to read data from the logger is used very often, so it is duplicated in several places:

- In the main menu Connected devices.
- On the Standard toolbar.
- In the context menu of the Loggers and Labels panels.

When selecting the command to read data from the logger, the “Reading archive” dialog opens (see Figure 42). In the “Logger” section of the dialog, the serial number and text label of the logger from which reading will be performed is displayed. In the “Time interval” section, the start and end time stamps of the time interval for which the data must be read are specified. To start the reading process, click the “Read” button. The reading process can be interrupted early. To do this, press the “Interrupt” button.

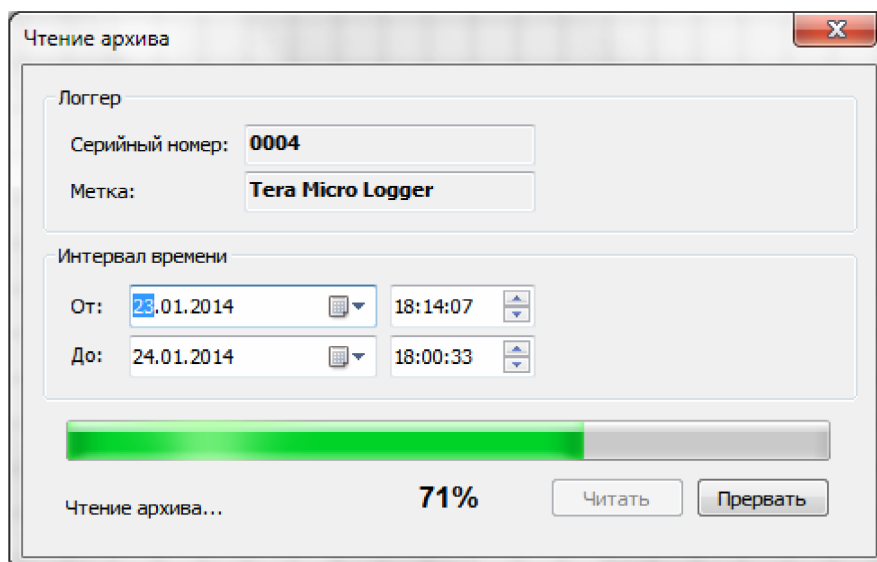


Figure 42. "Reading archive" dialog.

The operation of reading data consists of two stages, which are performed alternately. First, the archive data is read for the specified time interval, and then the logger event log is read. The progress of the operation is displayed in the status bar of the dialogue, as well as on the progress indicator. Execution details can be viewed in the program log. The read data is stored in the database and is available for viewing from that moment.

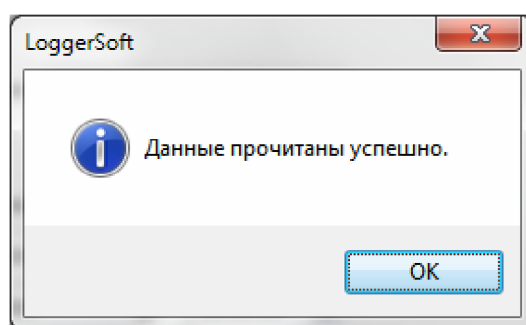


Figure 43. Message about the successful completion of the data reading operation.

If the data reading operation is successfully completed, the program will issue the message shown in Figure 43. If you click the "OK" button, the message window and the "Archive Reading" dialog will close, and the read data will be loaded into the data display area and presented as such, which is currently selected.

If an error occurs during reading, the program will issue a message describing the error. More detailed information about the error can be viewed in the application log.

#### 4.7. Viewing the archive

The data, once read from the logger and stored in the database, is available for viewing and analysis at any time regardless of the presence of the logger itself.

To view archived data, you need to select a logger in the "Loggers" or "Labels" panel by double-clicking the left mouse button. As a result, the serial number and label of this logger should appear on the archive viewing control panel. Then, on the same panel, you need to select the time interval for which you need to view the archive and click the download button. As a result, the process of downloading the archive from the database will begin. The progress of the process will be displayed in the status bar and in the application log. You can interrupt the download at any time using the "Abort" button. After the download process is complete, the archive will be presented in the data display area in the form that is currently selected. The data is ready for viewing. If you need to change the way information is presented, you should use the commands in the "View" main menu or the buttons on the "Standard" toolbar.

#### **4.8. Print graphics**

In order to print the schedule, you need to perform the following sequence of actions:

1. Select the logger, according to the data of which the schedule should be printed.
2. Download data from the database for the required time interval (see “Viewing the archive”).
3. Enable graph viewing, i.e. execute the main menu command “View → Graph”.
4. If a preview is needed, execute the main menu command “File → Preview”.
5. Execute the main menu command “File → Print”. If this command is not active, then you must first press the left mouse button on the data display area. The result of executing the command will be the opening of a standard print dialog. To print, select the printer and press the “OK” button.

#### **4.9. Print the table**

Printing a table is performed similarly to printing a graph (see the item “Printing a graph”).

#### **4.10. Print log of logger events**

The logger event log is printed in the same way as the second graph (see the “Printing a graph” section).

#### **4.11. Print the report**

An example of the report is shown in Figure 44.

In order to print the report, it is necessary to perform the following sequence of actions:

1. Select the logger for which you want to create a report.
2. Download data from the database for the time interval that corresponds to the reporting period (see the item “Viewing the archive”).
3. Enable report viewing, i.e. execute the main menu command “View → Report”.
4. If necessary, change the report parameters (see the “Report” item).
5. If a preview is needed, execute the main menu command “File → Preview”.
6. Execute the main menu command “File Print”. If this command is not active, then you must first press the left mouse button on the data display area. The result of executing the command will be the opening of a standard print dialog. To print the report, select the printer and press the “OK” button.



## Отчёт

Метка: DLT-01 #02  
Серийный номер: 02  
Начало отчётного интервала: 15.05.2014 11:02:20  
Окончание отчётного интервала: 15.05.2014 11:05:00  
Период архивирования: 10 секунд

Канал	Ед. изм.	Минимум	Максимум	Среднее
Температура	°C	28.19	28.31	28.28

### Таблица

Дата	Время	Темпера
15.05.2014	11:02:20	28.31
15.05.2014	11:02:30	28.31
15.05.2014	11:02:40	28.31
15.05.2014	11:02:50	28.31
15.05.2014	11:03:00	28.31
15.05.2014	11:03:10	28.31

Дата	Время	Темпера
15.05.2014	11:03:20	28.19
15.05.2014	11:03:30	28.31
15.05.2014	11:03:40	28.25
15.05.2014	11:03:50	28.25
15.05.2014	11:04:00	28.25
15.05.2014	11:04:10	28.25

Дата	Время	Темпера
15.05.2014	11:04:20	28.25
15.05.2014	11:04:30	28.25
15.05.2014	11:04:40	28.31
15.05.2014	11:04:50	28.31
15.05.2014	11:05:00	28.31

### Журнал событий

Дата	Время	Описание события
15.05.2014	11:02:28	Архивирование остановлено
15.05.2014	11:02:28	Настройка логгера
15.05.2014	11:02:29	Запуск архивирования с выкл. сигнализацией

### График

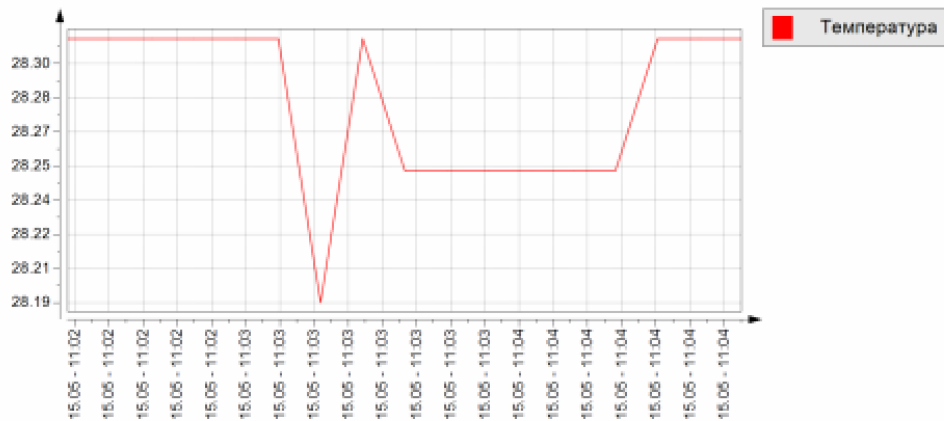


Figure 44. An example of a report.

## 4.12. Log of the user's life

During the operation of the program, the user action is recorded in the user event log. Users with appropriate rights can view this log.

To open the user event log (see Figure 45), you need to execute the main menu command “Tools → User event log”.

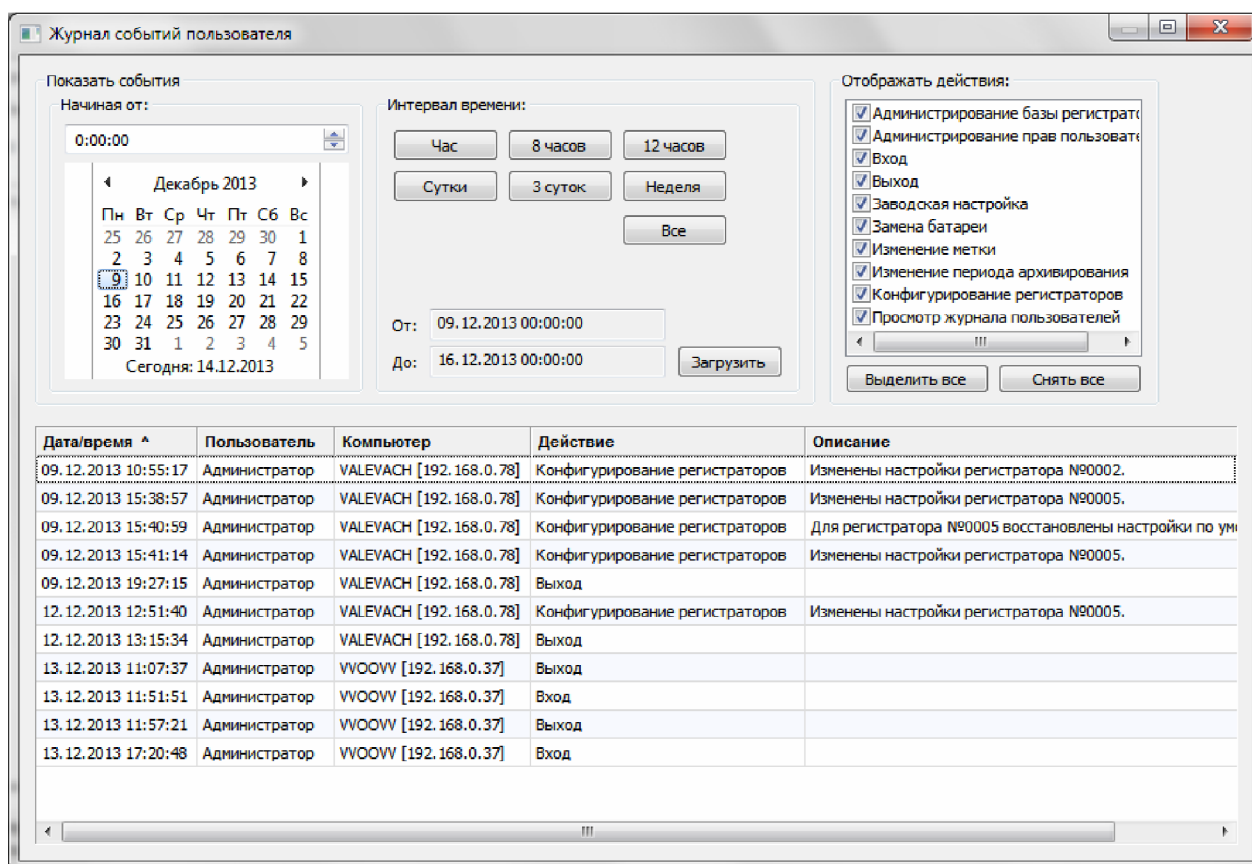


Figure 45. User event log.

When the user's event log is opened, a list of events for the current day is automatically loaded.

To view the list of events for a different time, you need to specify the required time period in the “Show event” section and click the “Download” button. The time period is selected as follows. First, you need to choose the date and time from which you want to show the event. Then choose the duration of the time segment using the buttons: “Hour”, “8 hours”, “12 hours”, “Day”, “3 days”, “Week”. To view the list of events from the selected date and time to the present time, click the “All” button.

The log for each event contains the following information:

- Timestamp of events.
- The user who performed the action.
- The computer from which the action was performed.
- The type of action that was taken.
- Text description of the action.

To filter the event by type, there is a list in the “Display action:” section. In this list, you need to mark the types of events that need to be displayed. When the filter is changed, the list of events will be dynamically updated. To quickly change the filter, there are buttons “Select all” and “Remove all”.

The list of events can be sorted by any column in the table. To sort the event, you need to click the left mouse button on the column header. Clicking again on the heading of the same column changes the sorting direction. The column by which the list is currently sorted and the sorting direction are marked with a special marker.

Some events may have a long text description. Therefore, for the convenience of viewing detailed information on a separate event, you can double-click with the left mouse button on the line with the event you are interested in. As a result, this event will be opened in a separate dialog box, an example of which is shown in Figure 46.

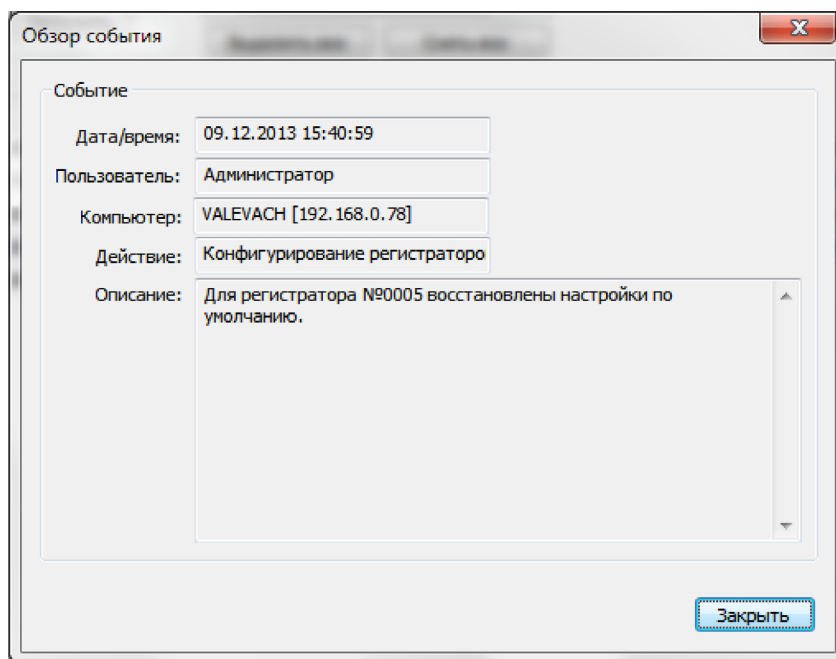


Figure 46. "Event Overview" dialog.

The user event log can be exported to a file (see "Export data").

#### 4.13. Data export

LoggerSoft supports data export in CSV<sup>1</sup> format. Any program table can be exported: archive data table, logger event log table, user event log table.

To export data, you need to open the desired table and click on it with the right mouse button. Then, in the context menu that appears, select the command "Export data to a CSV file" and specify the name of the file to be saved.

## 5. CONFIGURING THE LOGGERSOFT PROGRAM

### 5.1. Database

The coordinates of the database are the IP address or name of the computer on which the database is located and the name of the database itself. The database name is preset and in most cases you do not need to change it.

By default, the database coordinates point to the local computer. If LoggerSoft and Firebird are installed on the same computer, you do not need to configure the database location.

<sup>1</sup> CSV (Comma-Separated Values) is a text file designed to provide tabular data. Each line of the file is one line of the table. Values of individual columns are separated by separator characters.

To change the database settings, you need to execute the main menu command “Settings → Database...”. As a result, the “Database Settings” dialog will be opened (see Figure 47), in which you need to enter the database coordinates.

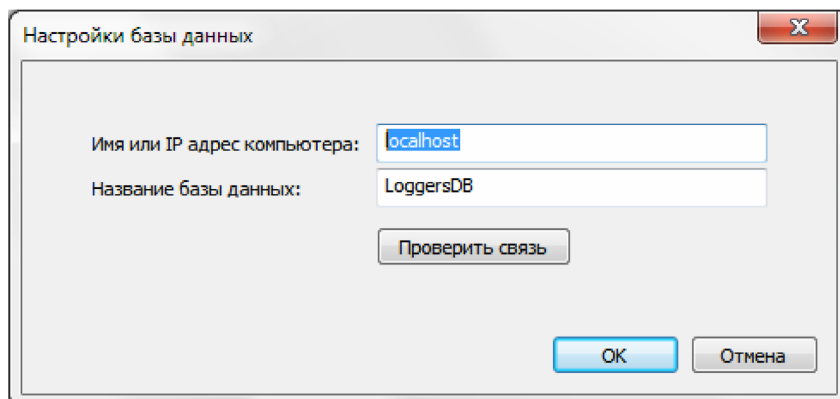


Figure 47. Database Settings dialog.

In the Computer Name or IP Address field, enter the name or IP address of the computer on which Firebird was installed. Click the “Check connection” button to make sure that there is a connection with the database at the specified coordinates. If the connection check is successful, click the “OK” button. The program will connect to the database, which will be indicated by a green database connection indicator in the status bar.

## 5.2. Administration of user rights

LoggerSoft has a flexible user authorization system. All users are divided into groups according to authority. Individual rights are assigned to each group. A user who joins a group automatically receives all the rights of the given group. The user can enter several groups at the same time and at the same time he receives the rights of all these groups. In addition, the user can be assigned additional personal rights (in addition to group rights).

After installing the program, there is only one user in the database - “Administrator”. The default password for this user is set. This user belongs to the “Administrators” group, which has full rights. Accordingly, the “Administrator” user also has full rights. This user is used to administer user rights and configure the application.

**WARNING!** It is strongly recommended to change the password of the “Administrator” user to avoid unauthorized access to the database and malicious actions that can be performed even unintentionally.

To administer user rights, you need to log in to the program on behalf of the “Administrator” user (or another user with similar rights) and use the main menu command “Settings → User rights...”. As a result of these actions, the “Administration of user rights” dialog will be opened, which is shown in Figure 48.

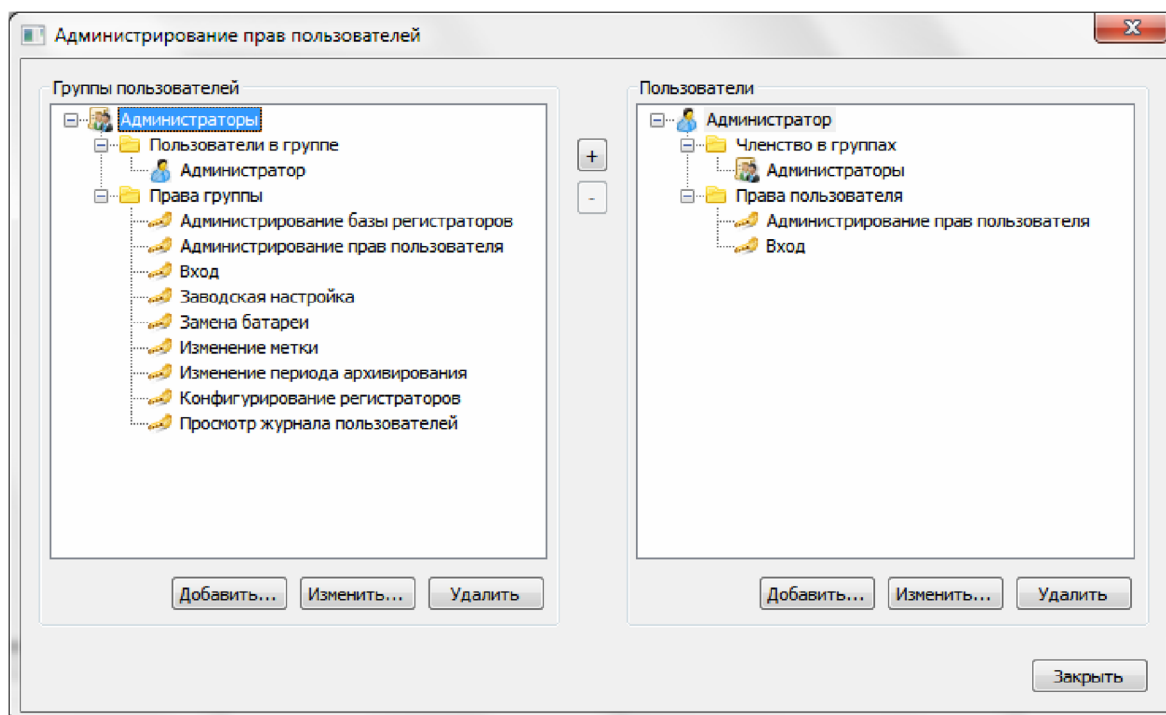


Figure 48. "Administration of user rights" dialog.

In the left part of the dialog there is a tree with a list of user groups, and in the right - a tree with a list of users.

If you open the user group node in the tree, you can see two child nodes: "Users in the group" and "Group rights". If you open the "Users in group" node, you can see which users belong to this group. If you open the "Group rights" node, you can see a list of actions that are allowed for this group.

If you open the user node in the tree, you can see two child nodes: "Membership in groups" and "User rights". If you open the "Membership in groups" node, you can see a list of groups to which these users belong. If you open the "User rights" node, you can see a list of actions that are allowed for this user in addition to group rights.

Under each tree there are three buttons, the availability of which depends on which node in the tree is selected at the moment. All three buttons are active if a group node or a user node is selected in the tree, respectively.

If you click the "Add..." or "Change..." button under the user group tree, the edit user group dialog will open (see Figure 49) to create a new or edit an existing group, respectively. If you click the "Delete" button, the program will ask for confirmation of the deletion of the user group, and if permission is granted, the group will be deleted.

If you click the "Add..." or "Change..." button under the user tree, the user edit dialog will open (see Figure 50) to create a new or edit an existing user, respectively; if you click the "Delete" button, the program will ask confirmation of user deletion, and in case of agreement, the user will be deleted.

NOTE. It is not possible to delete the user who is currently logged in to the program.

The "+" and "-" buttons between the group tree and the user tree are for adding users to a group and removing users from a group, respectively. The availability of these buttons depends on which nodes are currently selected in the trees.

If you select the group node on the left, and the user node on the right, the "+" button will become active. Clicking this button adds the user highlighted on the right to the group highlighted on the left. The program will first ask for confirmation.

If you open the "Users in group" node in the group tree and select a user in the list that opens, the "-" button will become active. Clicking this button will remove the user from the group. The program will first ask for confirmation.

### 5.2.1. Editing a user group.

User group editing is carried out using the dialog shown in Figure 49. The header of the dialog indicates which action is being performed: editing an existing group or creating a new one.

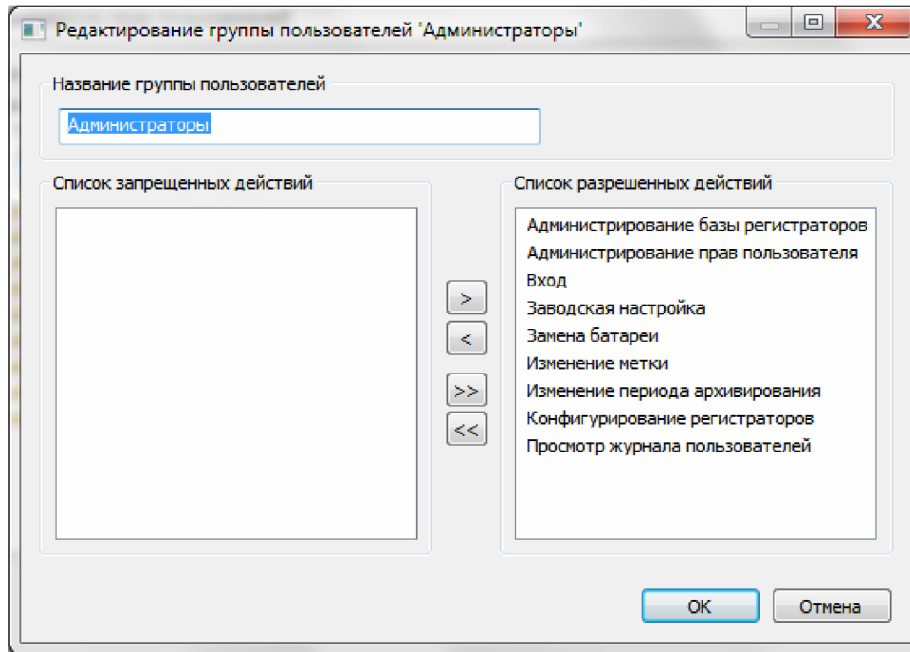


Figure 49. "Edit user group" dialog.

In the "User group name" section, you need to enter the name of the group. The main part of the dialogue is occupied by two lists: "List of prohibited actions" and "List of permitted actions". Those actions that should be allowed to the group should be moved to the list of allowed actions. To move actions from one list to another, you can use the buttons located between the lists. The ">" and "<" buttons move only the currently selected actions. The ">>" and "<<" buttons move all actions at once. You can also move actions from one list to another by double-clicking the left mouse button on one action in the list.

Click the "OK" button to save the change. The "Cancel" button closes the dialog without saving the changes.

### 5.2.2. Editing users.

Users are edited using the dialog shown in Figure 50. The header of the dialog indicates which action is being performed: creating a new user or editing an existing one.

In the "User data" section, you can specify the user's last name, first name, patronymic, but only the last name is a mandatory field. Also in this section there is a button "Set password..." or "Change password..." depending on the action for which the dialog was opened.

If the dialog is open for creating a new user, you can set a password for the new user using the "Set password..." button. In response to pressing this button, the "Set password" dialog opens (see Figure 36).

If the dialog is open for changing an existing user, then using the "Change password..." button, you can change the password of the edited user. In response to pressing this button, the "Confirmation of authorizations" dialog will open (see Figure 35). For more details, see in the item "Changing the user's password".

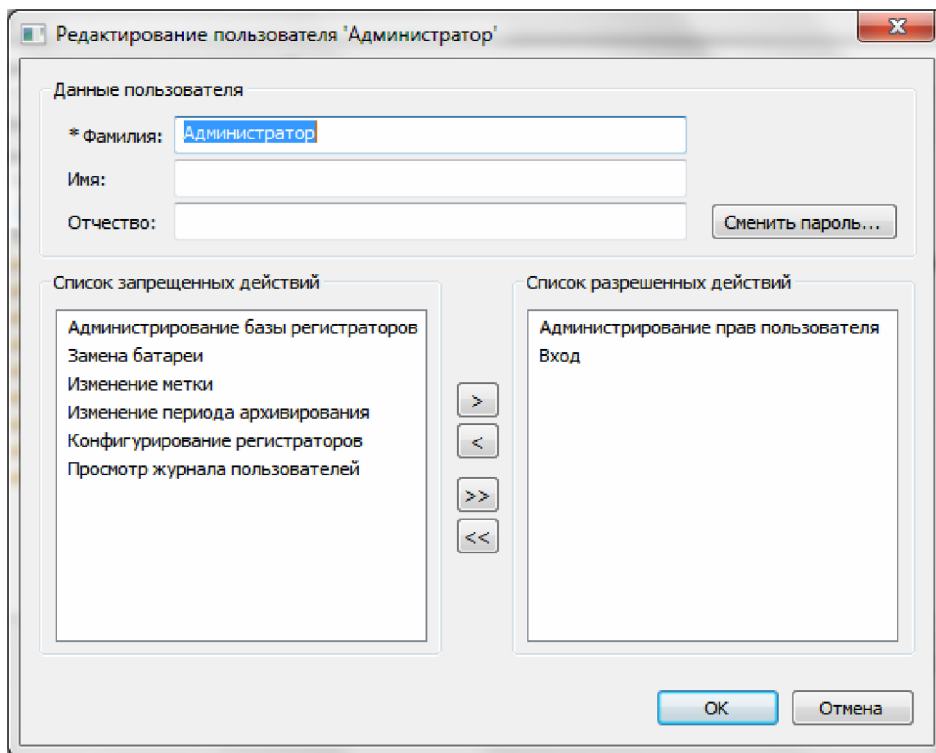


Figure 50. Edit user dialog.

There are also two lists in the dialog: “List of prohibited actions” and “List of permitted actions”. If you need to set personal permissions for the user, then you need to put the corresponding action in the list of allowed actions. Transferring actions between lists is carried out in the same way as when editing a user group (see the item “Editing user groups”).

By pressing the “OK” button, the changes are saved. The “Cancel” button closes the dialog without saving the changes.

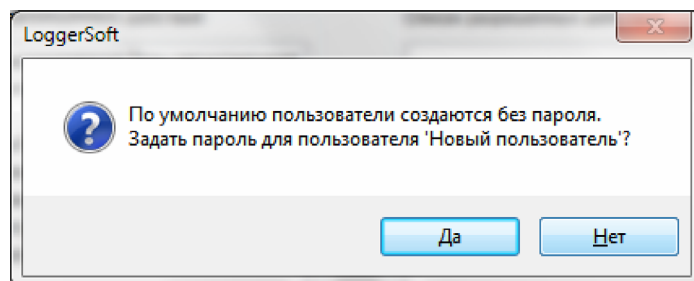


Figure 51. Request to create a password.

If the dialog was opened to create a new user, but no password was set, then if the changes are saved, the program will ask for creating a password (see Figure 51). If you click the “No” button, the user will be created without a password. If you click the “Yes” button, the “Set password” dialog will open (see Figure 36).

### 5.3. Supported device types

#### 5.3.1. General Information.

The device type is determined by a combination of the device’s internal name and firmware version. To work with devices of any type, the program needs a memory card and a configured template of the given type of device. A template can be created automatically based on a memory card.

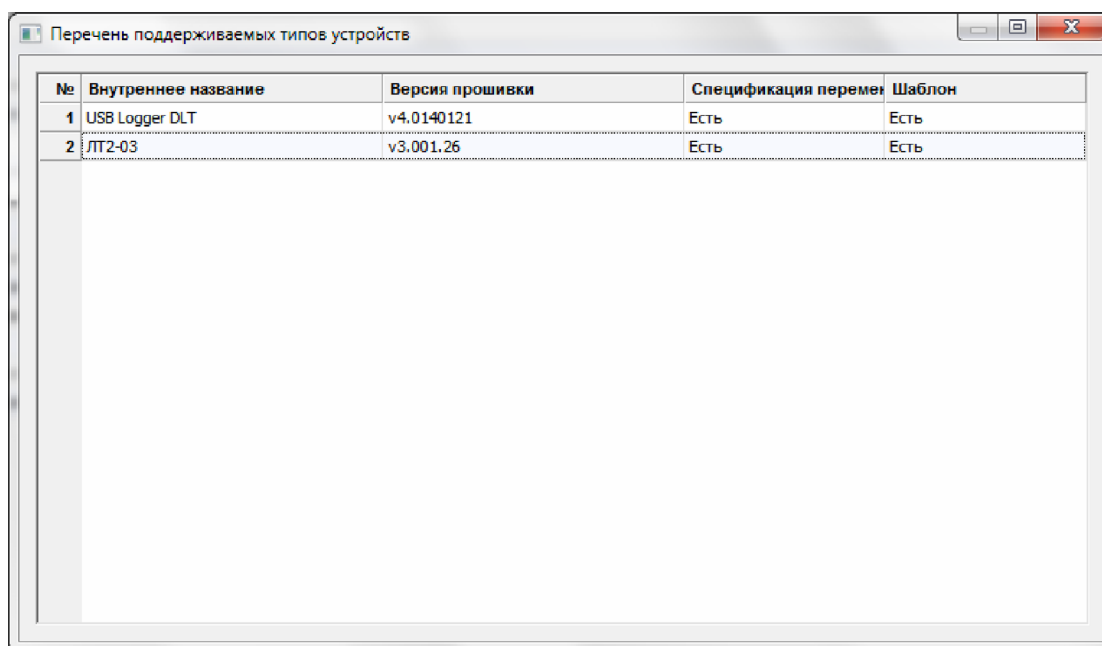
In case of connecting to the computer a device whose type is unknown, the program automatically adds this type to the database. If there is a memory card for this type of device, a specification of variables is created, which is also automatically stored in the database. In the absence of a memory card, the program will not be able to work with this type of device, and will issue a message about this. If the specification of variables is created successfully, then the program automatically creates a template based on the specification. At the same time, the names of the logical parameters will correspond to the internal names of the corresponding variables. After that, the program is ready to work with devices of this type.

In case of connecting to the computer a device whose type and template is already in the database, the program will synchronize the device with the database, as a result of which an instance of the device will be created in the database with a link to the serial number and a list of logical parameters of the instance according to the template .

The template that was created automatically is quite sufficient for work, but for convenience, you can change the names of the logical parameters to more understandable ones. For this purpose, it is possible to change the display of variable names in the specification, the name of the logical parameters in the template, and the name of the logical parameters of a specific instance of the device.

### 5.3.2. List of supported device types.

To check whether work with certain types of devices is supported or to configure its template, you need to execute the main menu command “Settings → Supported device types...”. As a result, a window will open, an example of which is shown in Figure 52.



№	Внутреннее название	Версия прошивки	Спецификация переменных	Шаблон
1	USB Logger DLT	v4.0140121	Есть	Есть
2	ЛТ2-03	v3.001.26	Есть	Есть

Figure 52. List of supported device types.

The list of supported device types is presented in the form of a table. For each device type, its internal name, firmware version, variable specification availability, and template availability are indicated.



To perform any action with a device type, you need to call the context menu for this type. The context menu is called by clicking the right mouse button on the line and type of devices of interest. The context menu of the device type is shown in Figure 53.

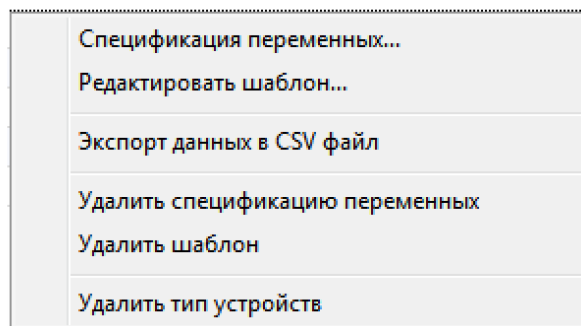


Figure 53. Device type context menu.

The command “Specification of variables...” opens a window with a list of variables of this type of device. An example of such a window is shown in Figure 54. If there is no specification of variables for this type of device in the database, the program will offer to create a specification based on the memory card.

The command “Edit template...” opens a window with a list of logical parameters of this type of devices. An example of such a window is shown in Figure 56. If the template for this type of device is not in the database, the program will offer to create it based on the specification of variables.

The “Export data from CSV file” command allows you to export the list of supported device types to a file (see the “Data export” item).

The “Delete variable specification” command allows you to delete the variable specification of this type of device. Before deleting, the program asks for confirmation.

**NOTE.** The template is deleted simultaneously with the specification, so if there is a template, the program asks for additional confirmation to delete the template.

The “Delete template” command allows you to delete a template of this type of device. Before deleting, the program asks for confirmation.

The “Delete device type” command allows you to delete a device type from the database along with the variable specification and the template. Before deleting, the program asks for confirmation.

**WARNING!** If there are devices of the type you are deleting in the database, then all instances of devices of this type will be deleted along with the device type. In this case, the program will issue an additional warning. However, be very careful when deleting a device type.

### 5.3.3. Specification of variables.

The variable specification is created based on the device type memory map. A memory card is a text file in a special format. Memory maps are located in the Devmap folder, which in turn is located in the folder where the program is installed. By default, this is a folder

C:\Program Files\TERA\LoggerSoft.

The specification of variables is presented in the form of a table (see Figure 54). Each row of the table corresponds to one variable from the memory card. The table contains the Display Name column, whose cell can be edited, and the columns that cannot be edited: internal name, data type, size, and access rights.

“Display Name” is the text that will be used as the name of the logical parameters when creating the template. To change the name of the displayed variable, double-click the left mouse button on the cell to be changed. As a result, an input field will appear in this cell. Make the necessary changes and press the “Enter” key to save the changes to the database or the “Esc” key to cancel the changes.

The “Internal name” column shows the original name of the variable in the memory card. The data type of the variable is indicated in the “Data type” column. The size of the variable is indicated in the “Size” column. And in the “Access rights” column, the access rights for the variable are indicated.

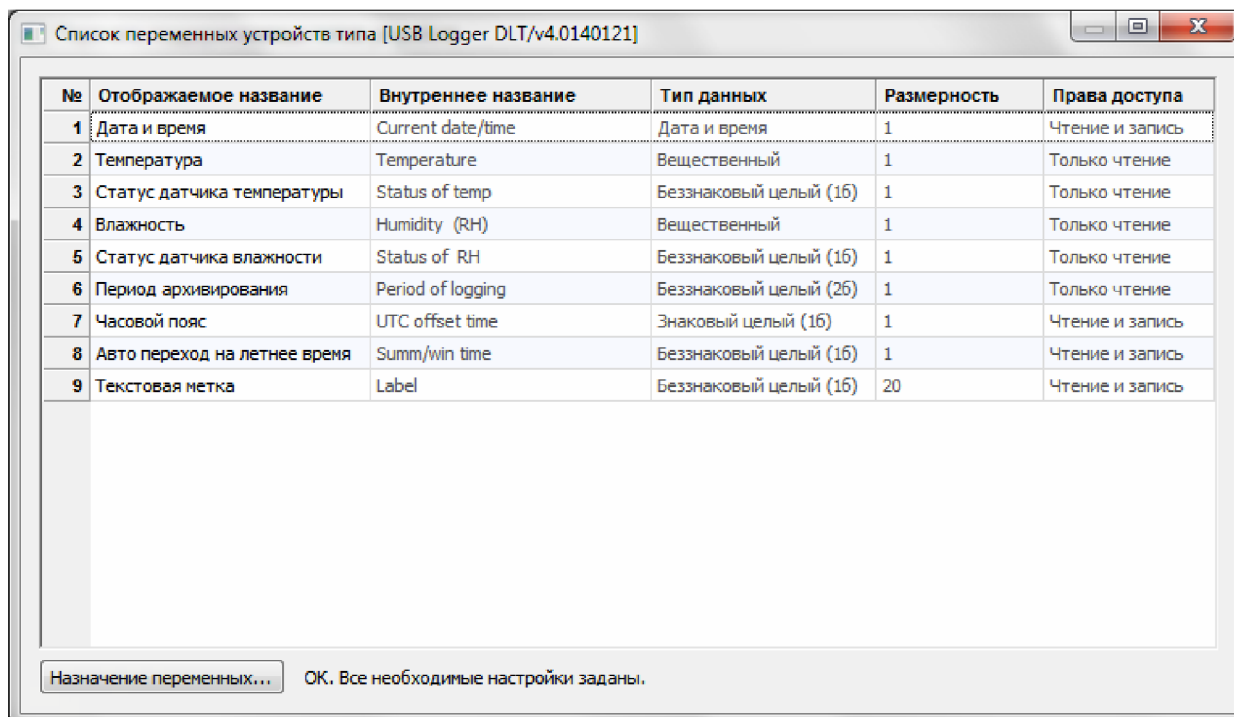


Figure 54. List of device type variables.

Each type of device must be assigned a number of key variables that are used by the program for time synchronization and reading/writing of the text label. For this, the “Name of variables...” button is located at the bottom of the dialog. Next to the button is an inscription about the current state of the settings. If all the necessary key variables are set, then the inscription will be as follows: “OK. All necessary settings are set.”. If the key variables are not specified, then the inscription will be as follows: “CAUTION! It is necessary to specify the assignment of variables!”.

Clicking on this button opens the “Device type settings” dialog (see Figure 55).

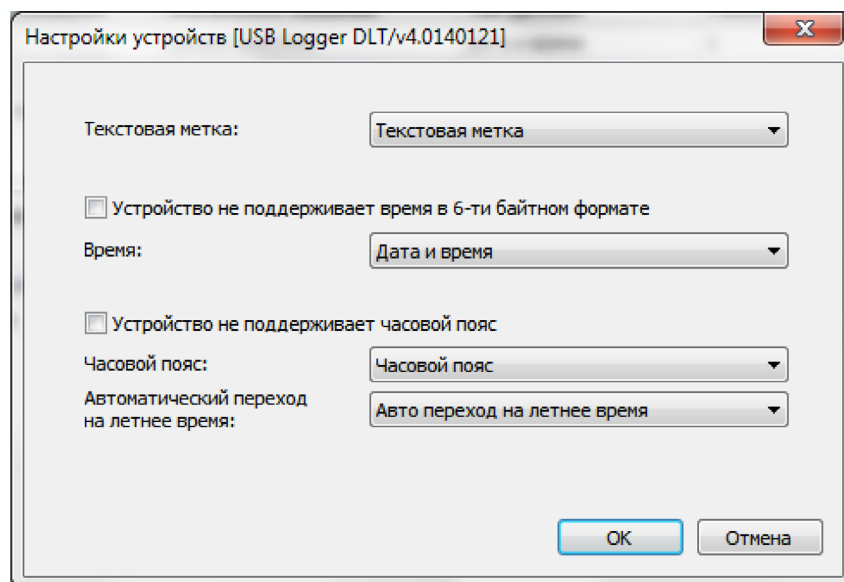


Figure 55. Device type settings.

In this dialog, you need to specify the variable for the text label, the device time, the time zone, and also the variable responsible for setting the automatic transition to summer time. If the device does not support setting time zones, then the “Device does not support time zone” switch must be turned on. If the device does not support time in 6-byte format, then the switch “The device does not support time in 6-byte format” must be enabled.

To select a variable in the dialog, drop-down lists are used, which contain all the variables of this type of device.

The “OK” button closes the dialog and saves the changes made. The “Cancel” button closes the dialog without saving changes.

#### 5.3.4. Template.

The template is also presented in the form of a table (see Figure 56). Each row of the table corresponds to a logical parameter of a given type of device. The first three columns can be edited. These columns are: “Display name”, “Units of measurement” and “Archiving”. The last four columns are closed from editing. These are columns that contain information about the variable on the basis of which this parameter was created: “Variable name”, “Index”, “Data type” and “Access rights”.

№	Отображаемое название	Единицы измерения	Архивируется	Название переменной	Индекс	Тип данных	Права доступа
1	Дата и время	Единицы измерения не	Нет	Current date/time	0	Дата и время	Чтение и запись
2	Температура	Температура, °C	Да	Temperature	0	Вещественный	Только чтение
3	Статус датчика температуры	Единицы измерения не	Нет	Status of temp	0	Беззнаковый целый (16)	Только чтение
4	Влажность	Влажность, %	Да	Humidity (RH)	0	Вещественный	Только чтение
5	Статус датчика влажности	Единицы измерения не	Нет	Status of RH	0	Беззнаковый целый (16)	Только чтение
6	Период архивирования	Единицы измерения не	Нет	Period of logging	0	Беззнаковый целый (26)	Только чтение
7	Часовой пояс	Единицы измерения не	Нет	UTC offset time	0	Знаковый целый (16)	Чтение и запись
8	Авто переход на летнее время	Единицы измерения не	Нет	Summ/win time	0	Беззнаковый целый (16)	Чтение и запись

Figure 56. Device type template.

“Display name” is the text that will be used as the name of the logical parameters when creating a device instance from the template. To make changes in this column, double-click the left mouse button on the cell to be changed. As a result, an input field will appear in this cell. Make the necessary changes and press the “Enter” key to save the changes to the database or the “Esc” key to cancel the changes.

In the “Measurement unit” column, you must specify the measurement units for those parameters that are archived by the device. This information is used by the program when displaying archive data. In each cell of this column there is a drop-down list of all units of measurement known to the program (see the item “Units of measurement”).

In the “Archived” column, the signs of archiving of this parameter are indicated. For this, a drop-down list is built into the cells of this column. This information is used by the program when displaying archive data. In the case of creating a template when there is a connected device, this feature is set automatically, but there may be situations in which it needs to be done manually.

**NOTE.** Remember that when connecting each new device, the list of logical parameters is created according to the template of the given type of devices. Therefore, it is important that the template is fully customized and error-free.

#### 5.4. List of logical parameters of the device

Each logger in the database has a list of logical parameters that were created according to the template during the first synchronization with the logger database. But after the logical parameters of the logger have been created, they can be changed. In most cases, this is not necessary, but there are still situations when it is necessary to do this.

To change the settings of the logical parameters of a specific device, you need to execute the command from the context menu of the logger “List of logical parameters...” (see the item “Contextual menu of the logger”). As a result of executing this command, a window will open with a list of logical parameters of this logger, an example of which is shown in Figure 57.

№	Отображаемое название	Единицы измерения	Архивируется	Название переменной	Индекс	Тип данных	Права доступа
1	Время регистратора	Единицы измерения не	Нет	Current date/time	0	Дата и время	Чтение и запись
2	Температура	Температура, °C	Да	Temperature	0	Вещественный	Только чтение
3	Статус датчика температуры	Единицы измерения не	Нет	Status of temp	0	Беззнаковый целый (16)	Только чтение
4	Влажность	Влажность, %	Да	Humidity (RH)	0	Вещественный	Только чтение
5	Статус датчика влажности	Единицы измерения не	Нет	Status of RH	0	Беззнаковый целый (16)	Только чтение
6	Период архивирования	Единицы измерения не	Нет	Period of logging	0	Беззнаковый целый (26)	Чтение и запись
7	Часовой пояс	Единицы измерения не	Нет	UTC offset time	0	Знаковый целый (16)	Чтение и запись
8	Авто переход на летнее время	Единицы измерения не	Нет	Summ/win time	0	Беззнаковый целый (16)	Чтение и запись

Figure 57. Logger logical parameters.

Windows with a list of logical parameters of a specific logger are very similar to windows with a list of logical parameters of a template (see the “Template” item). It displays the same information, and editing parameters is done in a similar way. But the difference is that this window displays the parameters of the logical parameters of a specific device, and not the logical parameters of the template for the type of devices.

## 6. LOGGER SETTINGS

### 6.1. Series of loggers

The LoggerSoft program supports work with loggers of the LT series and loggers of the DLT series.

Since loggers of different series have different settings, different dialogs are used in the program to configure them. In addition, some of the functions that are available in DLT series loggers are not available for LT series loggers.

### 6.2. Time synchronization

Synchronization of the time of the logger with the time of the computer can be performed both at the request of the program during the search for the logger (see the item “Search for connected devices”), and at any time using the command “Time synchronization” from the main menu “Connected devices” or the context menu of the logger (see the item “Menu “Connected devices”” and the item “Contextual menu of the logger”). Time synchronization can also be done using the corresponding button in the logger settings dialog.

The progress of the time synchronization process is displayed in the application log window and in the status bar.

### 6.3. Change the text label

The text label of the logger serves to explain the functional purpose of the logger at the moment. This is an electronic analogue of a label or tag. Since the functional purpose of the logger can change over time, the text label can also be changed.

Changes to the text label of the logger are made using the “Change label” dialog (see Figure 58). You can open this dialog using the corresponding button in the logger settings dialog (see the item “Archiving tab” of the corresponding series of loggers).

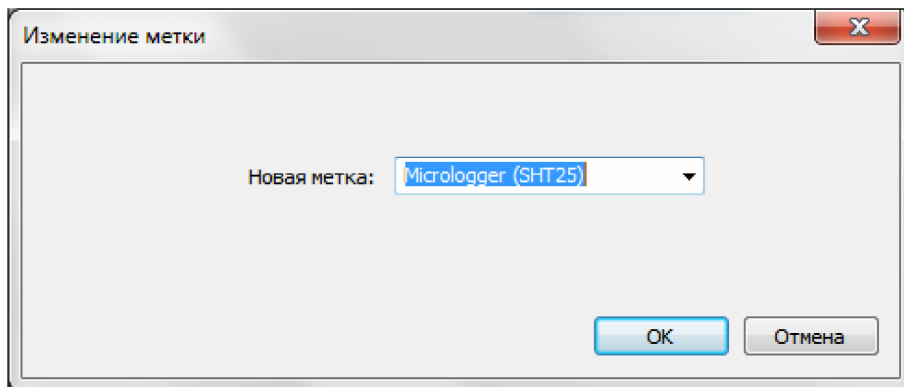


Figure 58. Change label dialog.

A new label can be entered from the keyboard or selected from the drop-down list. The drop-down list shows all the text labels that are currently in the database.

To change the label of the logger, press the “OK” button. As a result, the dialog will be closed and a new label will be recorded in the log. The program will inform you about the results of the recording using a message. The details of the operation can be viewed in the event log of the program.

If you click the “Cancel” button, the dialog will be closed without recording to the logger.

#### 6.4. Change of data on the protocol of metrological attestation

**NOTE.** The function of storing data on the protocol of metrological attestation is available only for loggers of the DLT series.

DLT series loggers store information about the metrological certification protocol in their non-volatile memory, which is set using the LoggerSoft program. This information includes the protocol number and its validity period.

Entering information about the metrological certification of the logger is carried out using the dialog “Data about the certification of the logger” (see Figure 59). You can open this dialog using the corresponding button in the logger settings dialog (see the “Archiving” tab).

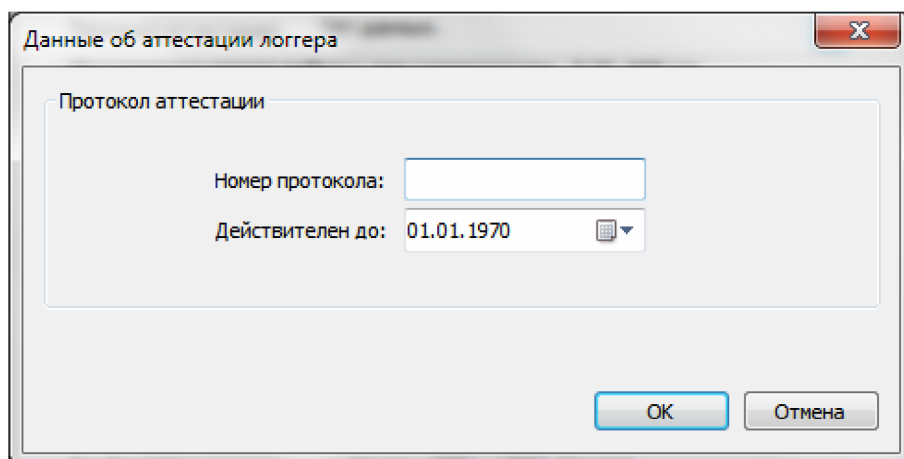


Figure 59. Logger certification data dialog.

In the “Protocol number” field, the number of the current metrological certification protocol of this logger should be indicated.

In the “Valid until” field, you should specify the date of the next logger check.

To record the specified information in the logger, press the “OK” button. As a result, the dialog will be closed and the recording will be performed. The program will inform about the result of the recording using a message. Details of the operation can be viewed in the program log.

If you click the “Cancel” button, the dialog will be closed without recording to the logger.

## 6.5. Changing the archiving period

The archiving period is the time interval during which the logger saves sensor readings in the internal non-volatile memory.

The archiving period is changed during the logger configuration (see “Configuring loggers”). The selection of a new period is carried out using the dialog “Selecting the archiving period”, an example of which is shown in Figure 60. You can open this dialog using the corresponding button in the logger settings dialog.

The archiving period is specified in the “Archiving period selection” section in the “New archiving period” field. This field is presented as a drop-down list containing valid period values.

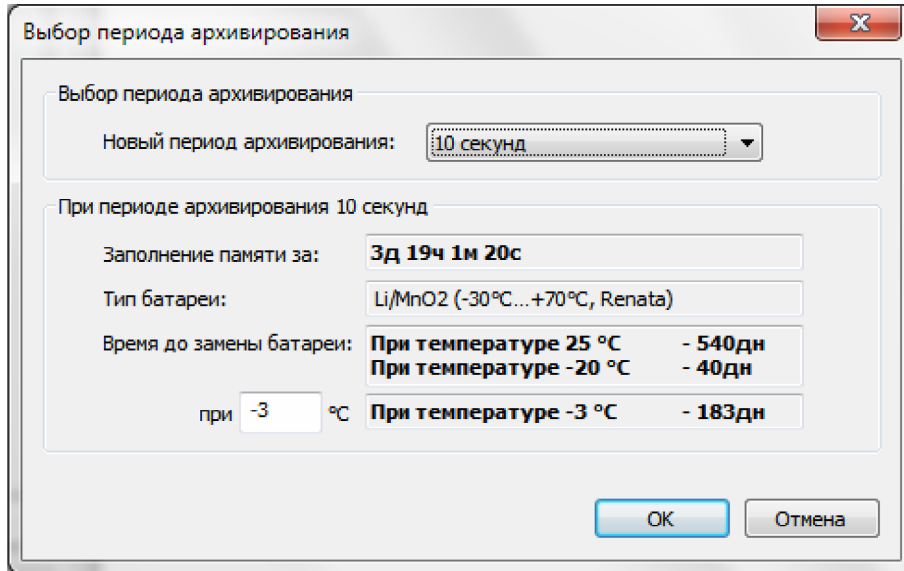


Figure 60. Choosing the archiving period dialog.

The “During the archiving period...” section contains important information about the logger, which depends on the selected archiving period.

The “Memory filling by” field displays the calculated filling time of the entire logger memory for the specified archiving period.

The “Battery Type” field displays the type of battery used by the logger. If the type of battery used by the logger is unknown to the program, then this field will contain the following text: “0. This type is not supported by the program.”

The “Time to battery change” field displays the predicted logger operation time for the specified archiving period. Estimated operating time is given for three ambient temperatures. Of these, two temperatures have a fixed value: 25°C and -20°C. But one temperature value can be set in the corresponding field.

**WARNING!** The operating time of the logger depends on the ambient temperature, as the battery capacity decreases at negative temperatures. Therefore, when setting up the logger, pay attention to the estimated operating time before the battery is replaced. Specify the temperature at which the logger is expected to be used. If the logger is supposed to be used in a certain temperature range, then the lowest temperature in this range should be indicated. If the predicted operating time of the logger at the temperature at which it is intended to be used is equal to or less than the time during which the logger is intended to be used, then the logger cannot be used. You should either increase the archiving period or change the battery.

**NOTE.** The function of predicting the remaining working time is available only for DLT series loggers.

To save the changes, press the “OK” button. To close the dialog without saving changes, click the “Cancel” button.

## 6.6. Adjustment of the LT series loggers

To set up the logger, you need to execute the “Settings...” command from the “Device Connection” main menu or the context menu of the logger (see the “Connected devices” menu item and the “Logger context menu” item). As a result of executing this command, the “Logger Settings” dialog will open, an example of which is shown in Figure 61.

The serial number of the logger whose settings are being performed will be indicated in the header of the dialog.

This dialog contains 5 tabs. Two of them have a fixed name - “Archive” and “Delayed launch”. The other three tabs correspond to the measurement channels of the logger and their names correspond to the names of the logical parameters, which in turn correspond to one or another channel of the logger measurement (see the item “List of logical parameters of the device”).

If the program is logged in on behalf of a user who has rights to perform factory settings, then the “Factory settings” tab will also be available in the dialog.

Using the “Read” button, you can read the current settings from the logger.

The “Apply” button is used to record new settings in the log.

The “Cancel” button closes the dialog.

### 6.6.1. Archiving tab

The “Archiving” tab (see Figure 61) contains settings related to the archiving process.

The “Logger time” field shows the current time of the logger, next to which the “Synchronize” button is located. If such a need arises, this button can be used to synchronize the time of the logger with the time of the computer.

The current text label of this logger is indicated in the “Label” field. To change it, you need to click the “Change...” button, which is located next to this field. In response to pressing the button, the “Change label” dialog will open, an example of which is shown in Figure 58 (see the item “Changing the test label”).

In the “Archiving period” field, the current logger archiving period is indicated. To change the archiving period, click the “Change...” button located next to this field. In response to pressing the button, a dialog for selecting the archiving period will open, an example of which is shown in Figure 60 (see the item “Changing the archiving period”).

The “Data storage by” field displays the estimated time to fill the entire memory of the logger during the specified archiving period.

**WARNING!** If the time to fill the entire memory is equal to or less than the time during which the logger is expected to be used, then the archiving period should be increased.

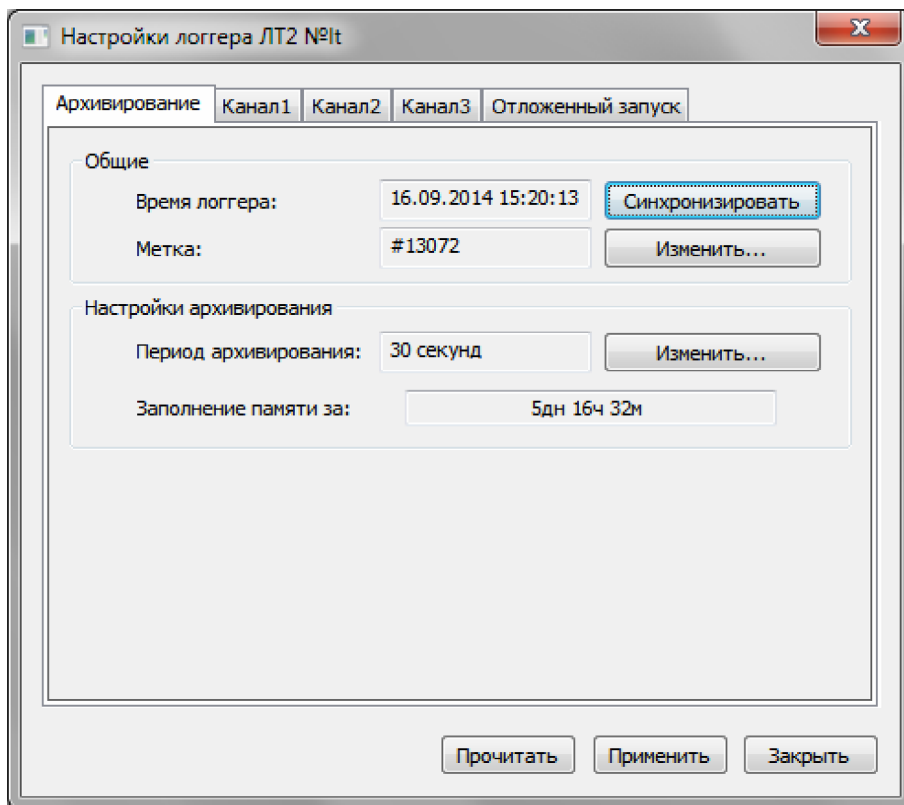


Figure 61. "LT2 logger settings" dialog. "Archiving" tab.

#### 6.6.2. "Delayed launch" tab

The "Delayed start" tab (see Figure 62) contains settings for the delayed start of the logger.

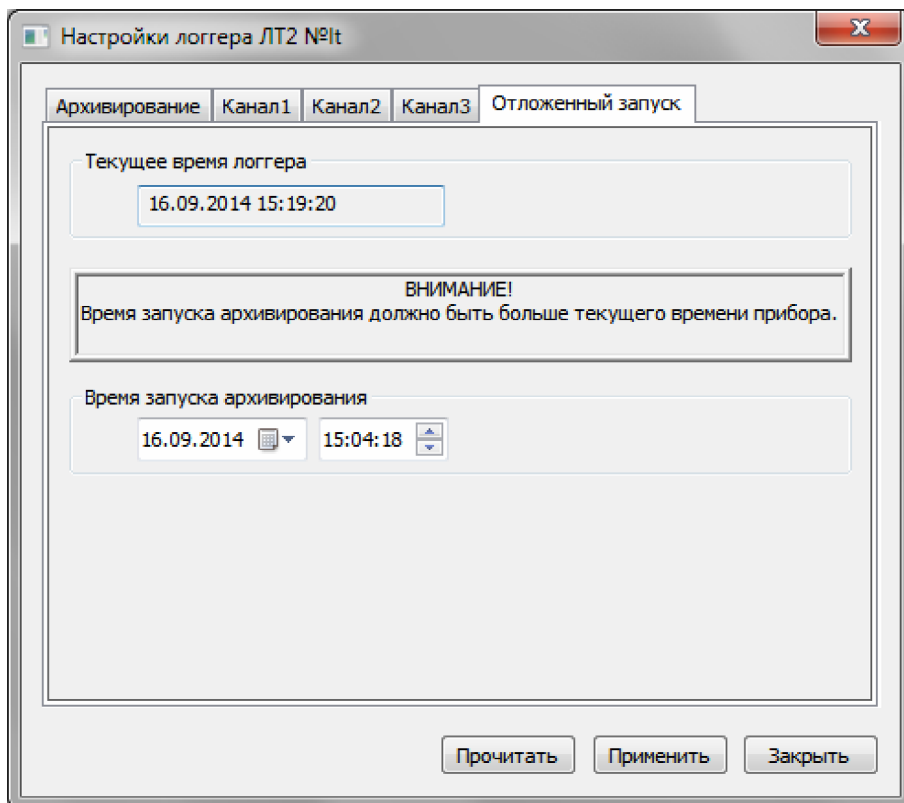


Figure 62. LT2 logger settings dialog. Delayed start tab.

The "Current time of the device" section displays the current time of the logger. If you need to synchronize the logger time with the computer time, you can do it in the "Archiving" tab (see "Archiving" tab).



In the “Archiving start time” section, you must specify the delayed start time.

**NOTE.** To enable the delayed start function, the archiving start time must be specified greater than the current logger time.

### 6.6.3. Measurement channel settings bookmarks

The measurement channel settings tabs are identical for all logger channels, but their contents may change depending on the factory settings of the logger. The name of the bookmarks corresponds to the names of the logical parameters, which in turn correspond to one or another measurement channel of the logger (see the item “List of logical parameters of the device”).

If the measurement channel is disabled, the tab will take the form of an example shown in Figure 63. There are no settings in the tab, as this channel is not used.

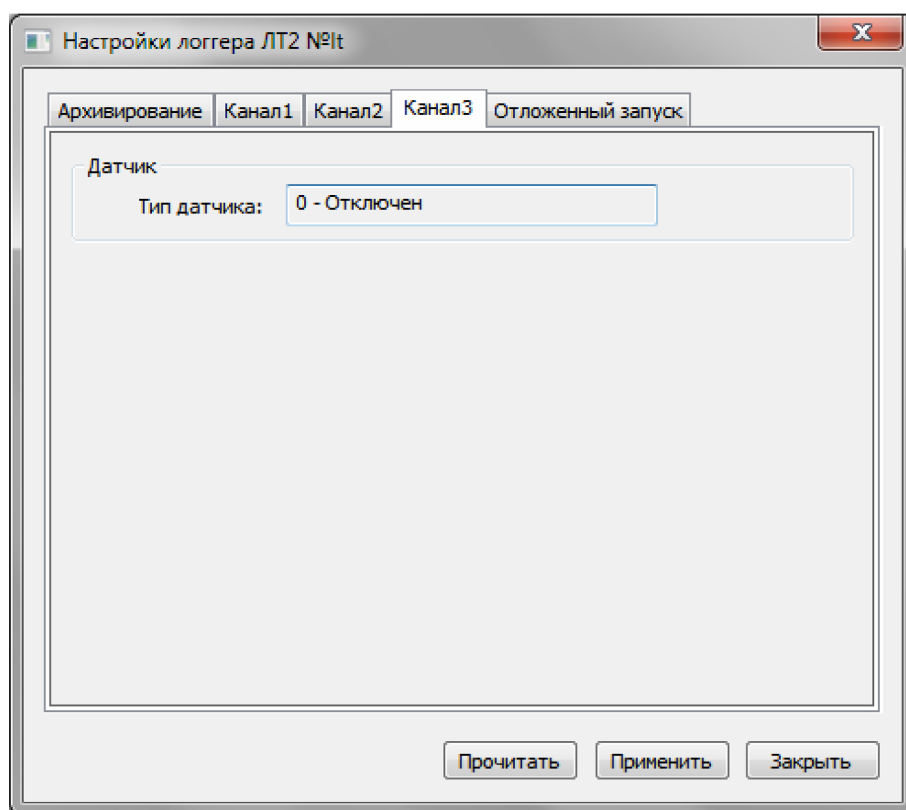


Figure 63. LT2 logger settings dialog. The measurement channel is disabled.

If the type of thermal resistance is specified for the measurement channel, the bookmark will take the form shown in Figure 64.

In the “Sensor” section, the type of sensor configured for this channel is indicated.

In the “Limit of permissible values” section, the upper and lower limits of permissible values are set. If the displayed sensor exceeds the specified limits, the logger will record this in the event log.

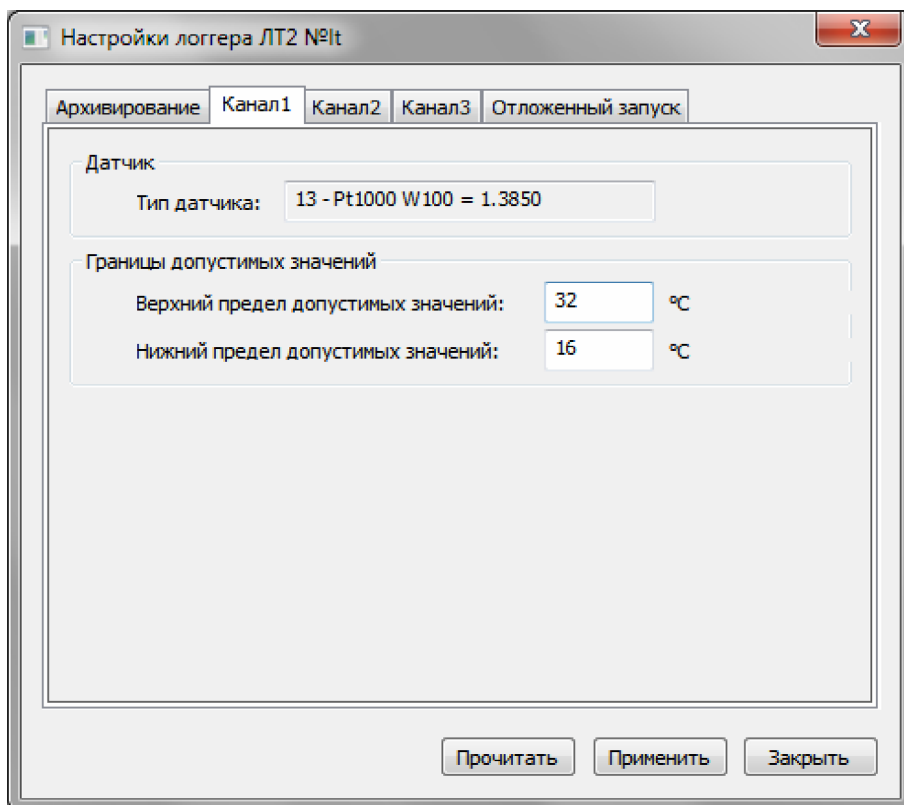


Figure 64. LT2 logger settings dialog. Thermal resistance.

If the current input type is specified for the measurement channel, then the bookmark will have the form, an example of which is shown in Figure 65.

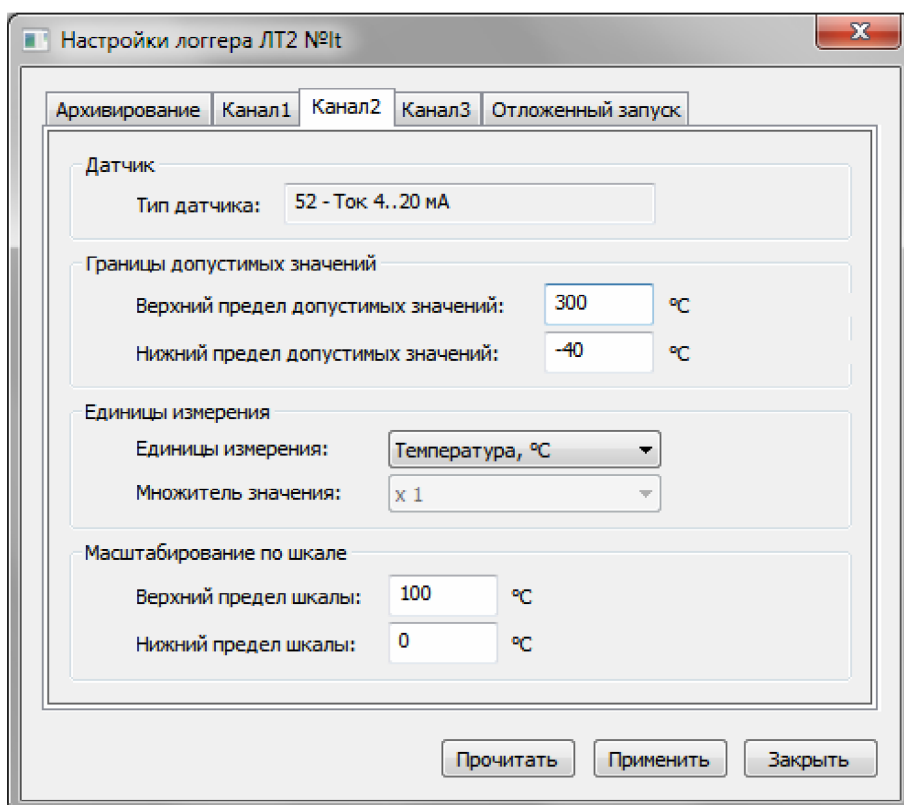


Figure 65. LT2 logger settings dialog. Current input.

In the “Sensor” and “Limits of permissible values” sections, the same settings as for the thermal resistance are set.

In the “Measurement units” section there is a drop-down list with measurement units and a drop-down list of value multipliers. The list of value multipliers is not available when selecting temperature or humidity as the measurement units.

In the “Scaling by scale” section, the upper and lower limits of the measurement scale are specified. Scaling is performed as follows. For example, the limits of the scales are set as in Figure 65, i.e. from 0 to 100°C. As a result, for a current input of 4...20 mA, a sensor reading of 4 mA will be converted to 0°C, and a 20 mA reading will be converted to 100°C.

## 6.7. Configuration of DLT series loggers

To configure the logger, you need to execute the “Settings...” command from the “Connected devices” main menu or the context menu of the logger (see the item “Connected devices menu” and the item “Logger context menu”). As a result of executing this command, the “Logger Settings” dialog will open, an example of which is shown in Figure 66.

The serial number of the logger being configured will be indicated in the header of the dialog.

This dialog contains several tabs, four of which are always present - “Archiving”, “Start”, “Buttons” and “Report”. Additionally, one bookmark is created for each measurement channel of the logger. In Figure 66, these are the “Temperature” and “Humidity” tabs. As already mentioned, the number of additional bookmarks depends on the number of measurement channels of the logger. The names of the additional tabs correspond to the names of the logical parameters, which in turn correspond to one or another measurement channel of the logger (see the item “List of logical parameters of the device”).

The “Restore default settings” button allows you to reset the current settings and restore the factory settings. Before performing this operation, the program asks for confirmation.

Using the “Read settings from the logger” button, you can read the current settings from the logger.

The “Load from file...” button allows you to load previously saved logger settings to a file.

The “Save to file...” button allows you to save the current logger settings to a file.

The “Stop archiving” button allows you to stop archiving data and put the logger into low power consumption mode. This button is inactive if archiving is not in progress.

The “Apply” button is used to record new settings in the log.

The “Close” button closes the dialog.

### 6.7.1. “Archiving” tab

The “Archiving” tab (see Figure 66) displays the current state of the logger, and also contains settings related to the archiving process.

The “Current logger status” section contains information about the current status of the logger. This information includes logger time, text label, final battery capacity, metrology certification protocol data, archiving status, and remaining battery run time at a given operating temperature.

In the “Logger time” field, the logger time is indicated, next to which the “Synchronize” button is located. If such a need arises, you can use the button to synchronize the time of the logger with the time of the computer.

The current text label of this logger is indicated in the “Label” field. To change it, you need to click the “Change...” button, which is located next to the field. In response to pressing this button, the “Change label” dialog will open, an example of which is shown in Figure 58 (see the “Change text label” item).

The final battery capacity at a temperature of 25°C is indicated in the “Battery capacity, mAh” field.

The “Attestation protocol” field displays the number and validity period of the metrological attestation protocol of this logger. Next to the field is the “...” button, with which you can change the data on the metrological certification protocol. In response to pressing this button, the “Logger certification data” dialog opens, an example of which is shown in Figure 59 (see the item “Changing data on the metrological certification protocol”).

Below the data on the certification protocol is the field of the current status of the logger. In this field, the remaining operating time of the logger before battery discharge at the specified operating temperature, as well as the current operating mode of the logger, are displayed in bold.

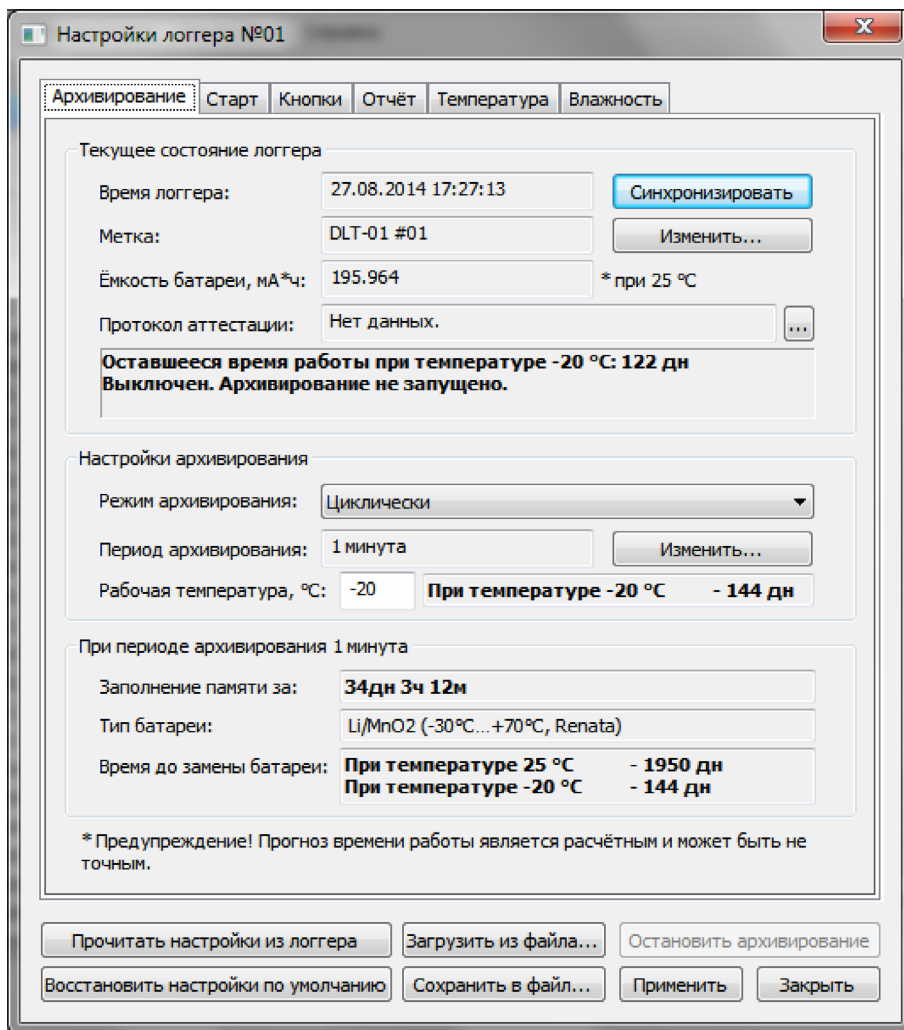


Figure 66. Logger Settings dialog. Archiving tab.

The "Archiving settings" section contains settings related to data archiving by the logger.

The "Archiving mode" field indicates the mode in which the logger should perform archiving. The mode is selected using a drop-down list. There are two modes in the list: "Cyclic" and "Until memory is full".

In the "Cyclic" archiving mode, the logger will write the archive continuously. After the memory is full, the oldest data will be overwritten with new data.

In the archiving mode "Until the memory is full", the logger will write the archive from the moment of the start of archiving (see the item "Start tab") and until the entire memory is filled. When all memory is full, archiving will stop.

In the "Archiving period" field, the current logger archiving period is indicated. To change the archiving period, click the "Change..." button located next to the field. In response to pressing the button, a dialog for selecting the archiving period will open, an example of which is shown in Figure 60 (see the item "Changing the archiving period").

The "Operating temperature" field indicates the ambient temperature at which the logger is expected to be operated. At the same time, the program automatically calculates the predicted operating time before the battery discharges at the specified temperature.

**WARNING!** The operating time of the logger depends on the ambient temperature, as the battery capacity decreases at negative temperatures. Therefore, when setting up the logger, pay attention to the estimated operating time before the battery is replaced. In the “Operating temperature” field, enter the temperature at which the logger is expected to be used. If the logger is supposed to be used in a certain temperature range, then the lowest temperature in this range should be indicated. If the predicted operating time of the logger at the operating temperature is equal to or less than the time during which the logger is expected to be used, then the logger cannot be used. You should either increase the archiving period or replace the battery.

The “During the archiving period...” section contains important information about the logger, which depends on the selected archiving period.

The “Memory filling by” field displays the estimated filling time of the entire logger memory for the specified archiving period.

**WARNING!** If the time to fill the entire memory is equal to or less than the time during which the logger is expected to be used, then the archiving period should be increased.

The “Battery Type” field displays the type of battery used by the logger. If the type of battery used by the logger is unknown to the program, then this field will contain the following text: “0. This type is not supported by the program.”

In the “Time until battery replacement” field, the predicted operating time of the logger for the specified archiving period is displayed. Estimated operating time is indicated for two ambient temperatures: 25°C and -25°C.

**WARNING!** The operating time forecast is an estimate and may be inaccurate.

#### 6.7.2. “Start” tab

The “Start” tab (see Figure 67) contains settings related to starting the archiving process.

In the section “Start archiving” there are settings for starting archiving.

In the “Launch method” field, you must specify the method of starting the archiving process. This field is presented as a drop-down list. There are three options in the list: “After setting”, “By button” and “At the specified time”.

If the “After setting” method is selected, the logger will start archiving immediately after new settings are written to it. For this startup method, you can set a startup delay.

If the “By button” method is selected, then in order to start the archiving process, it will be necessary to press the button on the logger. You can also set a launch delay for this launch method.

If the “At the specified time” method is selected, archiving will begin automatically at the specified time. This time is set in the same tab in the “Archiving start time” field.

In the “Delayed” field, the start delay is set, which is valid for the “After setting” and “By button” start methods. If this delay is set, then archiving will not start immediately after setting or pressing the button, but only after a delay time after the occurrence of the corresponding event. To set the startup delay, enter an integer value and select the units in which the delay is measured. A drop-down list is used to select the delay unit. The following units are listed: seconds, minutes, hours and days.

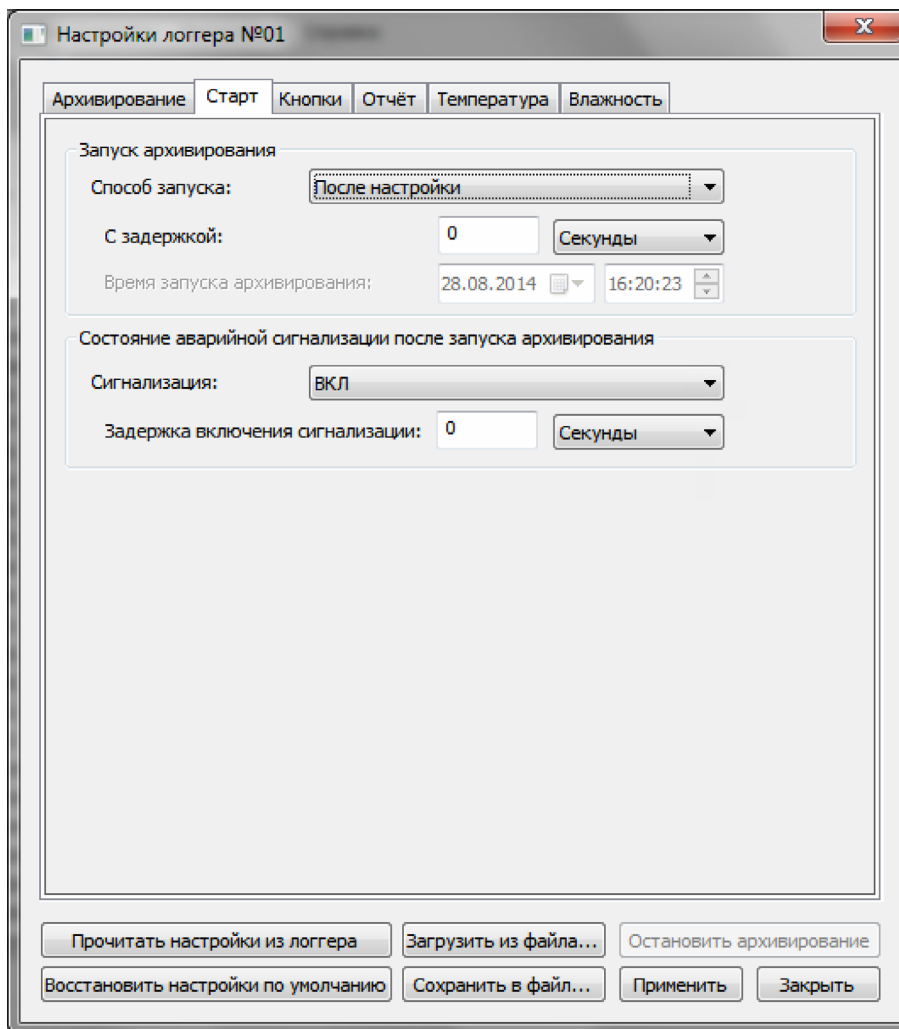


Figure 67. Logger Settings dialog. Start tab.

In the section “State of the alarm after starting the archiving” there are settings for the start of the alarm.

In the “Alarm” field, you must specify the initial state of the alarm after starting archiving. A drop-down list is used to select the initial state. There are two states in the list: “ON” and “OFF”.

When the alarm state is “OFF”, the logger will archive sensor readings, but will not monitor the values of these readings.

If the alarm is in the “ON” state, the logger will archive and monitor sensor readings.

During the operation of the logger, it will be possible to switch it from the “OFF” state to the “ON” state and vice versa using the button, if this is allowed in the settings (see the item “Buttons” tab).

You can set a delay to switch to the “ON” state. This delay is indicated in the “Alarm activation delay” field. To set the delay, enter an integer value and select the units in which the delay is measured. A drop-down list is used to select the delay unit. The following units are listed: seconds, minutes, hours, and days. If this delay is set, the logger will go to the “ON” state not immediately after pressing the button, but only after the delay time.

### 6.7.3. Buttons tab.

In the “Buttons” tab (see Figure 68), the settings for the operation of the logger buttons are specified.

In the “Button functions” section there are settings, and in the “Tip” section - a description of the current settings.

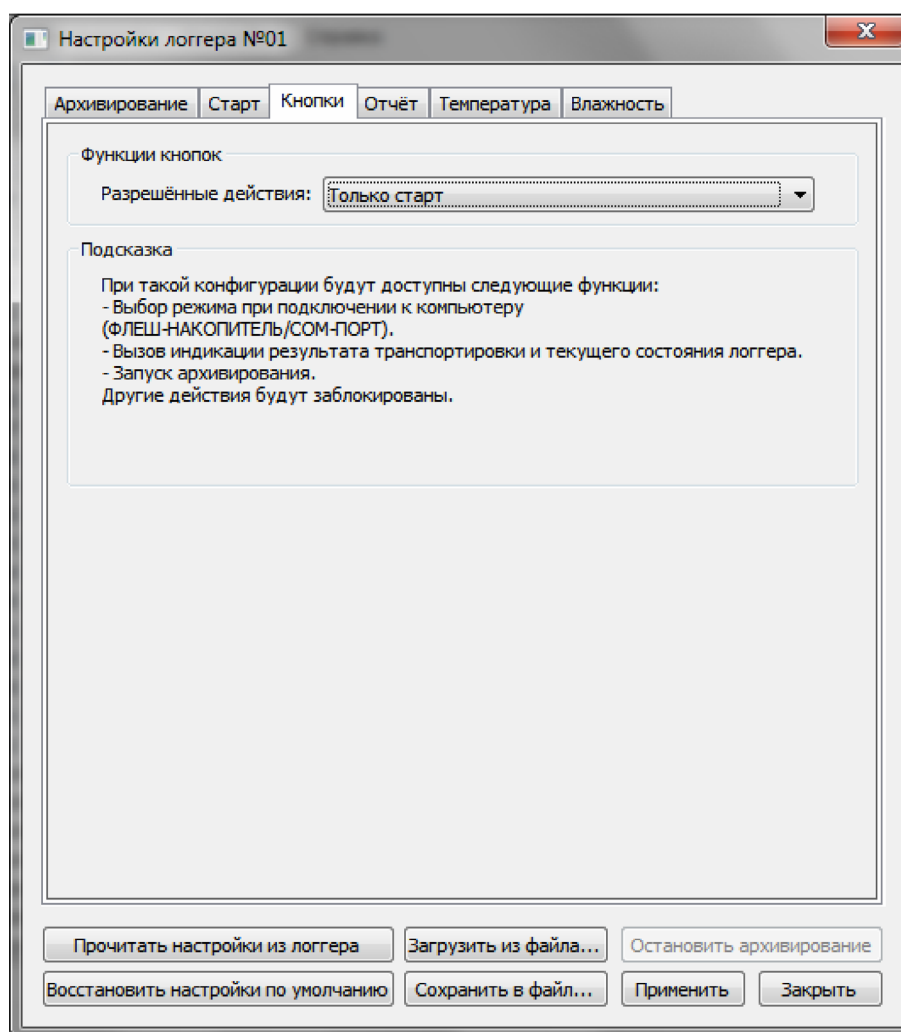


Figure 68. Logger Settings dialog. Buttons tab.

In the “Allowed actions” field, restrictions on the actions that can be performed using the logger buttons are set. The field is made in the form of a drop-down list. The following options are available in the list: “Indication only”, “Start only”, “One delivery only” and “No restrictions”.

If the item “Indication only” is selected, then using the logger buttons you can only display the current state of the logger and the results of cargo transportation. Other actions will be blocked.

If the item “Start only” is selected, then, in addition to calling the indication, the archiving process can also be started using the buttons. Other actions will be blocked.

If the item “Only one delivery” is selected, then in addition to calling the indication and starting the archiving process, the function of switching the state of the emergency alarm will also be available. But at the same time, it will be possible to turn on the emergency alarm only once.

If the item “Unlimited” is selected, then using the logger buttons you can perform any actions: calling the indication of the current status of the logger and the results of transportation, starting the archiving process, switching the alarm status an unlimited number of times.

#### 6.7.4. Report tab.

In the “Report” tab (see Figure 69), the parameters of the report generated by the logger when connected to a computer in FLASH drive mode are set.

In the “Language of the report” field, specify the language in which the report will be generated. By default, the logger generates a report in Russian. The list of languages available for selection is in the drop-down list. This list depends on the firmware of a specific logger.

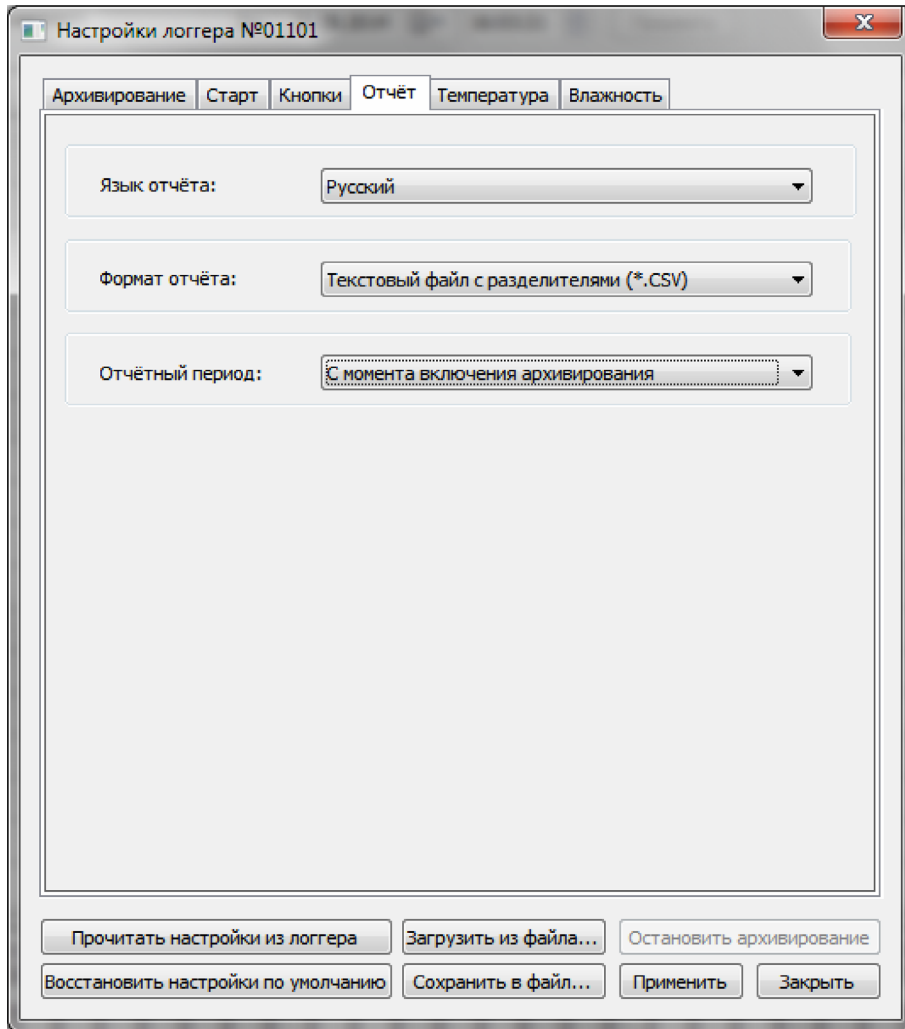


Figure 69. Logger Settings dialog. Report tab.

The file format for the report is specified in the “Report format” field. The field is made in the form of a drop-down list. The list contains the following options: “Text file with delimiters (\*.csv)”<sup>1</sup> and “PDF file (\*.pdf)”. This field may be inactive depending on the firmware of a specific logger.

In the “Reporting period” field, specify the period for which the report should be generated. The field is made in the form of a drop-down list. The list contains the following options: “Since archiving was enabled” and “Last session of alarm operation”. In the first case, the report will be created for the period from the moment archiving is enabled to the moment the report is generated, i.e. all accumulated data. In the second case, the report will be created for the period from the moment the emergency alarm was last turned on to the moment it was turned off, or until the report was generated, if the emergency alarm has not yet been turned off.

<sup>1</sup> CSV (Comma-Separated Values) is a text file designed to provide tabular data. Each line of the file is one line of the table. Values of individual columns are separated by separator characters.



### 6.7.5. Measurement channel settings bookmarks.

The measurement channel settings tabs (see Figures 70 - 72) are identical for all logger channels. The names of the tabs correspond to the names of the logical events of the parameters, which in turn correspond to one or another measurement channel of the logger (see the item “List of logical device parameters”).

In the “Measurement units” section, there are the settings of the measurement units and value multipliers for this channel. Both fields are made in the form of a drop-down list, the content of which depends on the firmware of a particular logger.

In the “Sensor settings” section there are buttons for accessing the sensor settings of this measurement channel. The button “Sensor settings...” allows you to open the dialog of user settings of the sensor (see Figure 73 and the item “Dialog of user settings of the sensor”). If the program is logged in on behalf of a user who has rights to perform factory settings, then the “Factory settings...” button will also be available. Clicking on this button opens the factory settings dialog for this measurement channel.

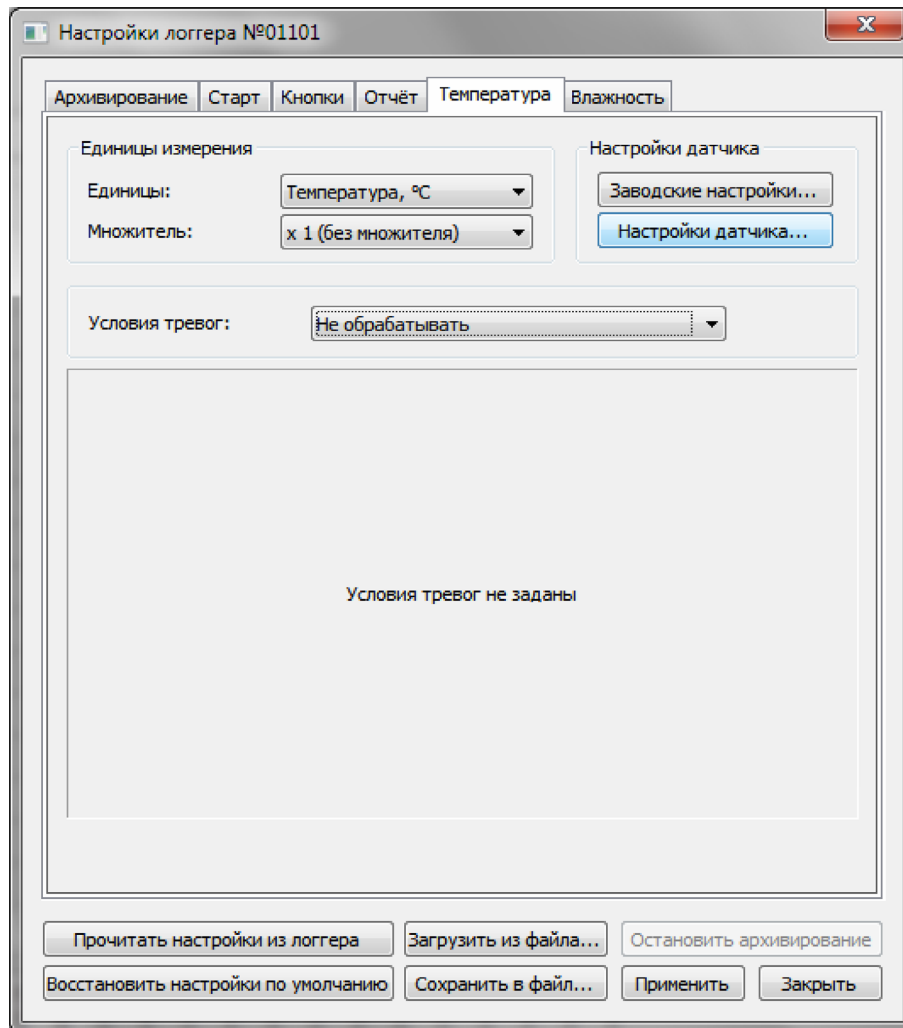


Figure 70. Measurement channel settings tab. Alarm conditions are not set.

The appearance of the bookmark depends on the selected option for handling alarm conditions. The option for processing alarm conditions is selected using the drop-down list in the “Alarm conditions” field. There are a total of three options in the drop-down list: “Do not process”, “Minimum/Maximum” and “Multilevel”. The alarm condition is a criterion by which the logger will evaluate the result of cargo transportation.

If the item “Do not process” is selected, the bookmark will take the form shown in Figure 70. With this setting, the logger will only archive the readings of this measurement channel without controlling the value of these readings.

If the item “Minimum/Maximum” is selected, the bookmark will take the form shown in Figure 71.

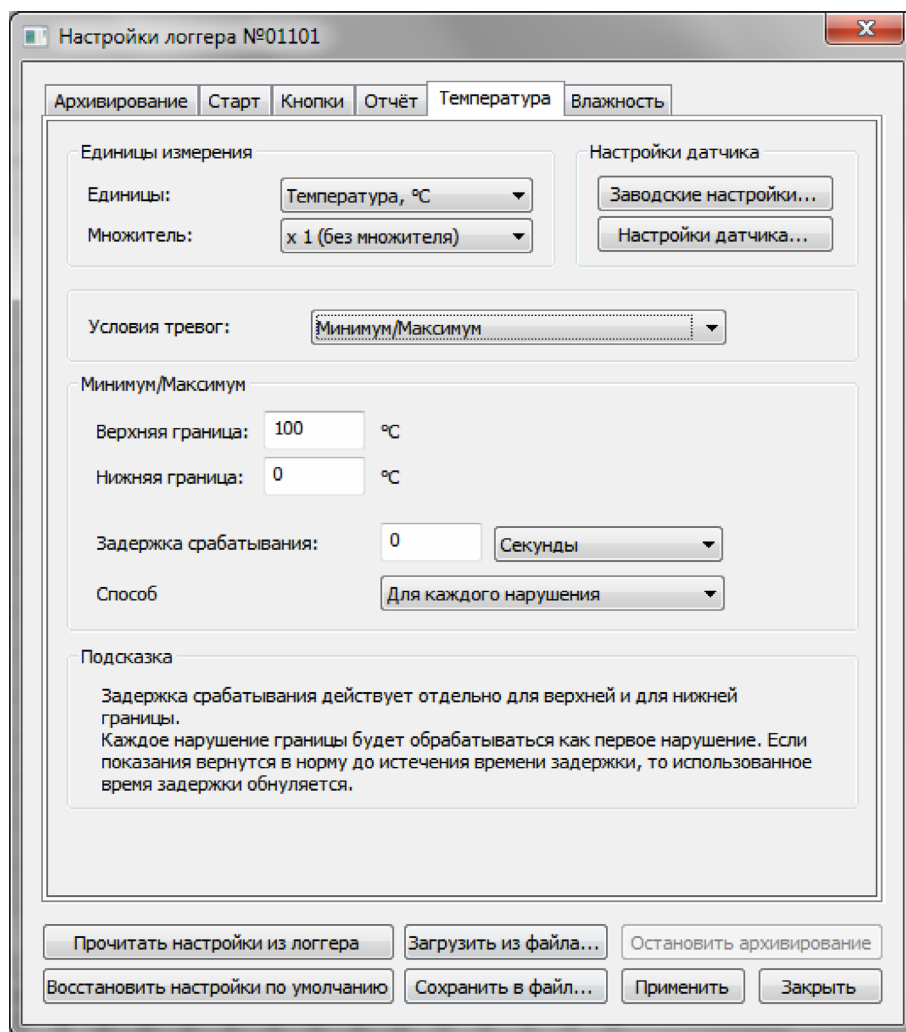


Figure 71. Measurement channel settings tab. Minimum/Maximum.

In the “Minimum/Maximum” section, the upper and lower limits of the permissible values for this channel are specified. In case of violation of these limits, the logger will record relevant events in the log and accumulate statistics. These statistics will be used in the future when forming the results of cargo transportation.

In the “Activation delay” field, you can specify the alarm activation delay in case of violation of the limit of permissible values. The delay works as follows. If the limit is violated during the time that is more than the activation delay, then the alarm is triggered and the result of cargo transportation will be negative. If the channel readings return to the acceptable corridor before the trigger delay time expires, the alarm will not trigger and the transport result will be positive. To set the delay, enter an integer value and select the units in which the delay is measured. A drop-down list is used to select the delay unit. The following units are listed: seconds, minutes, hours, and days.

**NOTE.** This delay applies separately to the upper and lower limits of the permissible values.

In the field “Method of accounting for the delay” the method of accounting for the alarm activation delay is indicated. The following options are available in the drop-down list of this field: “For each violation” and “Total for all violations.” If the item “For each violation” is selected, then the specified alarm activation delay will be effective for each violation of the limit. That is, after the readings return to the corridor of permissible values, the used delay time will be reset to zero. If the item “Total for all violations” is selected, the activation delay time is distributed to all limit violations as follows. In case of another violation, the time during which the limit was violated is subtracted from the remaining delay time. As a result, if the total time of all limit violations exceeds the alarm activation delay time, the result of cargo transportation will be negative. If the total time of all limit violations does not exceed the delay time, the result of transportation will be positive.

The “Hint” section displays information about the selected method of accounting for the alarm activation delay.

If the “Multilevel” item is selected in the “Alarm conditions” field, the bookmark will take the form shown in Figure 72.

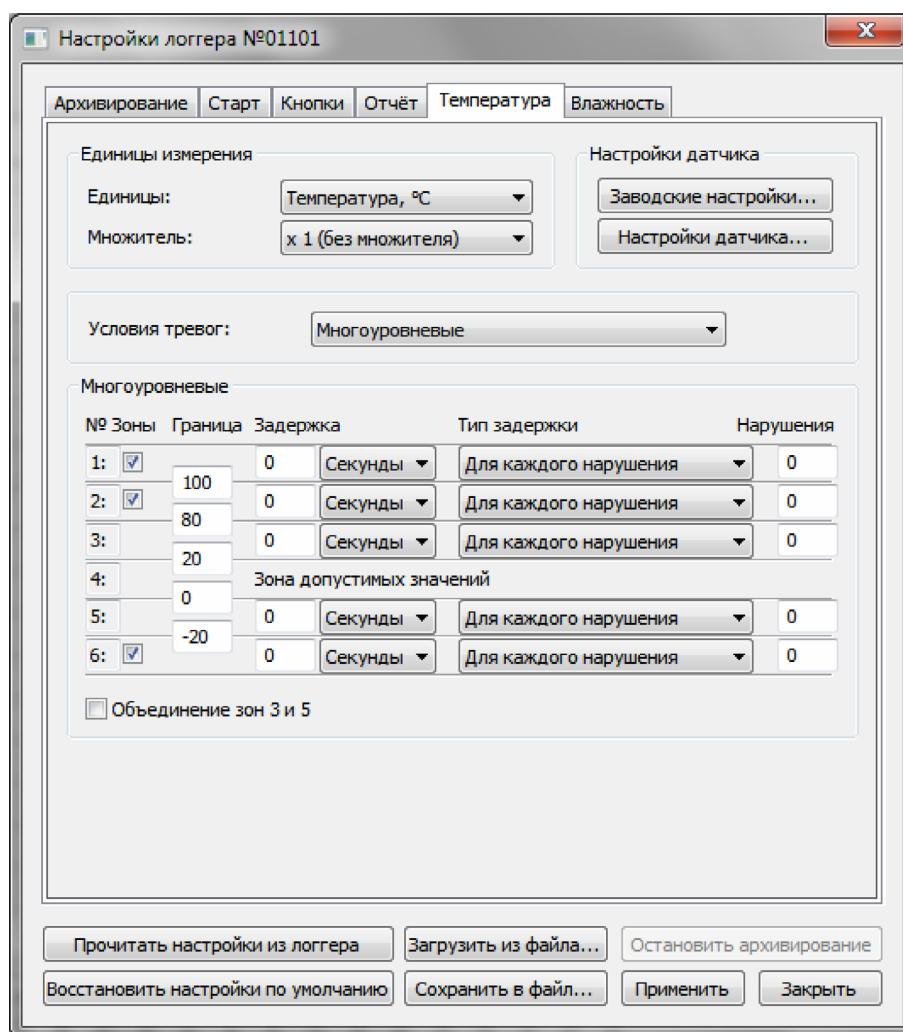


Figure 72. Measurement channel settings tab. Multilevel anxiety.

The mode of multi-level alarms allows you to divide the reading scale into 6 zones, where zone #1 is the zone of the largest values, and zone #6 is the zone of the smallest values. At the same time, zone No. 4 is considered a zone of permissible occupations. For each zone, the limits, the alarm activation delay (or the permissible time of being in this zone), the method of accounting for the activation delay and the permissible number of limit violations are indicated. When checking the results of cargo transportation, the logger will analyze the statistics for each zone separately, and if an alarm was triggered in at least one zone, the result of transportation will be negative. If there are no alarms in any of the zones, then the result of transportation will be positive.

The boundaries of the zones are indicated in the fields located at the intersection of the zones.

To set the delay, enter an integer value and select the units in which the delay is measured. A drop-down list is used to select the delay unit. The following units are listed: seconds, minutes, hours, and days.

In the “Delay type” field, the method of accounting for the alarm activation delay is indicated. The following options are available in the drop-down list of this field: “For each violation” and “Total for all violations.” Processing of the delay accounting method is performed similarly to the method of delay accounting in the “Minimum/Maximum” alarm processing mode (see above).

The “Violations” field indicates the permissible number of violations of the boundary of this zone. This setting applies regardless of the alarm delay. If the boundary of the given zone is violated the number of times that is greater than specified in this field, then the alarm will be triggered for the given zone, regardless of whether the delay time has expired or not.

If fewer zones are required, zones #1, #2 and #6 can be disabled. To do this, you need to remove the check mark next to the number of the corresponding zone.

With the help of the “Combination of zones 3 and 5” switch, the zone of permissible values can be expanded. If this switch is on, then zones #3, #4, and #5 are included in the zone of permissible values.

#### 6.7.6. Dialog of user settings of the sensor.

The user settings dialog of the sensor is shown in Figure 73.

The “Sensor type” field is located in the “Sensor” section. The field is made in the form of a drop-down list. The content of the list and availability of the field depends on the specific logger and measurement channel.

The “Inclination” and “Offset” fields are located in the “Correction of readings” section. These are the coefficients that can be used to correct the deviation of the sensor readings from the standard. The availability of these fields depends on the specific logger and measurement channel.

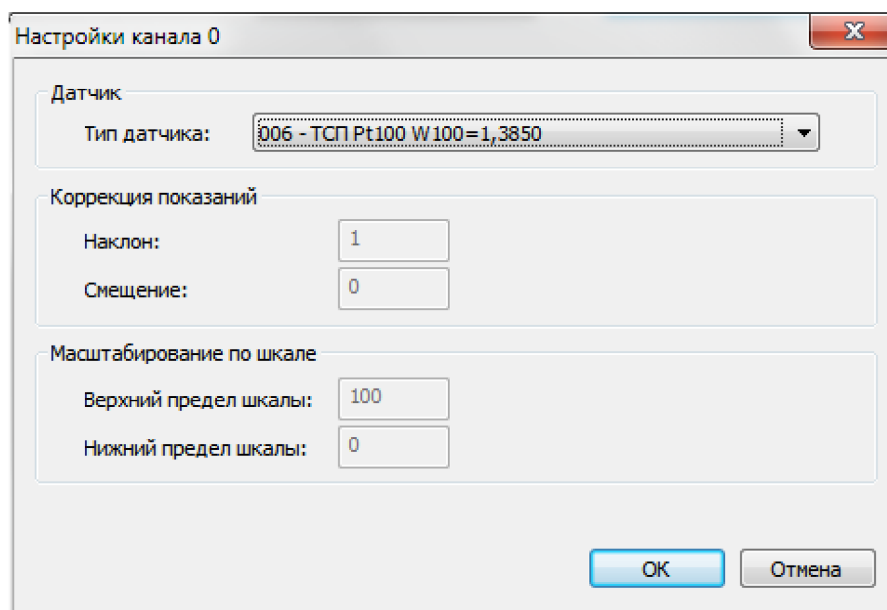


Figure 73. Channel Settings dialog.

In the “Scaling by scale” section, there are the fields “Upper limit of the scale” and “Lower limit of the scale”, which are used to scale the readings of analog sensors. The availability of these fields depends on the specific logger, measurement channel and sensor type.

### 6.8. Battery replacement

**NOTE.** The function of replacing the battery is available only for loggers of the DLT series.

This operation must be performed after physically replacing the battery in the logger. Performing this operation is necessary for correct forecasting of the remaining working time of the logger.

**WARNING!** Be extremely careful when performing the “Battery replacement” operation. This also applies to the choice of the battery itself. Since in the case of an error, the forecast of the remaining logger working time will be unreliable.

To perform the battery replacement operation, you must use the “Battery replacement...” command from the “Connected devices” main menu or the context menu of the logger (see the item “Connected devices menu” and the item “Logger context menu”). As a result of executing this command, the “Replace the battery” dialog will open, an example of which is shown in Figure 74.

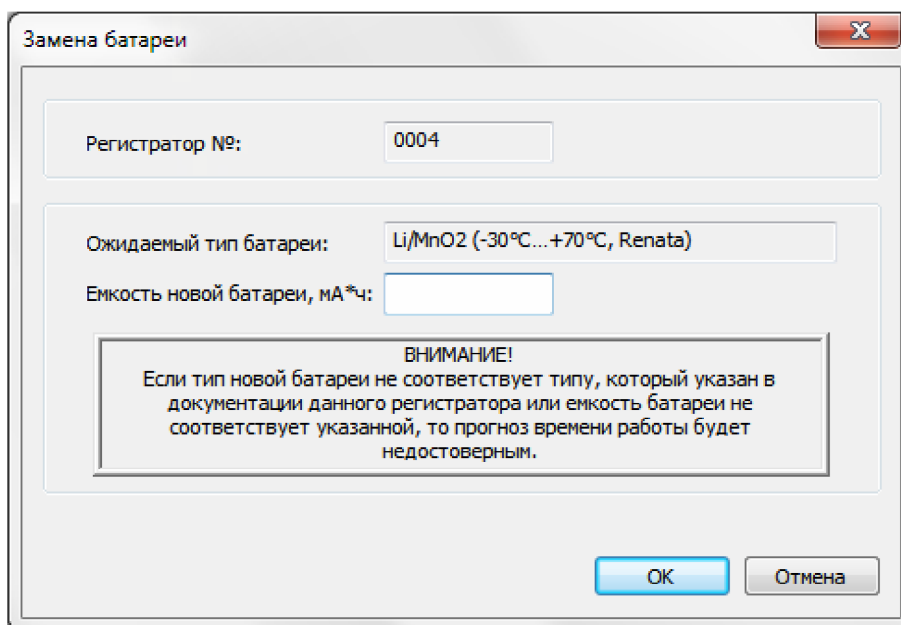


Figure 74. Battery replacement dialog.

The serial number of the logger and the expected battery type are indicated in the dialog. It is necessary to enter the capacity of the new battery and press the “OK” button to perform the operation or the “Cancel” button to close the dialog without performing the operation.

**WARNING!** If a different type of battery is inserted into the logger, the prediction of the logger’s operating time will be unreliable.

**WARNING!** If the capacity of the new battery indicated in the dialogue is greater than the actual one, then the forecast of the remaining logger operating time will be unreliable.

### 6.9. Clock calibration

**NOTE.** The clock calibration function is available only for DLT series loggers.

To calibrate the clock, you must log in to the program on behalf of a user who has the right to perform factory settings.

To calibrate the clock, you need to use the “Clock calibration...” command from the “Connected devices” main menu or the context menu of the logger (see the “Connected devices” menu item and the “Logger context menu” item) as a result of executing this command the “Logger clock calibration” dialog opens, an example of which is shown in Figure 75.

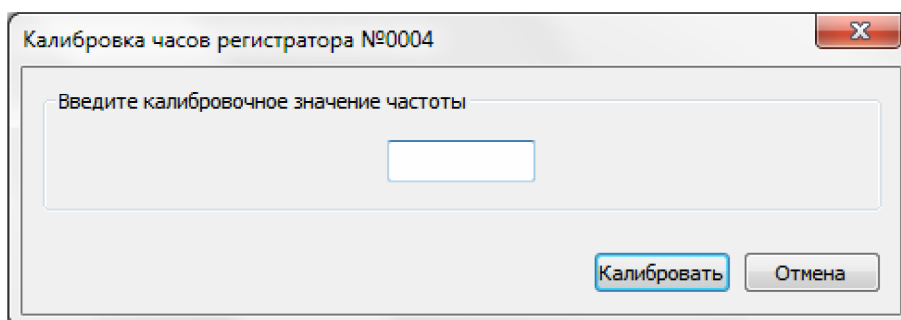


Figure 75. Logger clock calibration dialog.

In the dialog, you need to enter the calibrated frequency value and click the “Calibrate” button to perform the calibration operation, or the “Cancel” button to close the dialog without performing the calibration.