

**Software**  
**LoggerSoft**

**Version 1.02.01**

User Manual



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## Brief Description

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The LoggerSoft software is designed to work with data loggers with battery.

With LoggerSoft a user can configure loggers, read event logs and archives, view and analyze data, and print reports. All data that have been read from the data loggers are stored in the database and are available for viewing and analysis at any time.

LoggerSoft has flexible differentiation of user access rights. Available simultaneous data access for multiple users on the local network.

LoggerSoft Software is free and available for download on the website <http://ao-tera.com.ua/>.

This document is a complete user manual. It contains information on installing, configuring and using LoggerSoft software. It's recommended to review this document when getting started with the software.

System requirements:

- Windows 2000/XP/2003/Vista/7/8
- Processor 1 GHz
- Memory 512 MB RAM
- Free hard disk: 50 MB (for program files)
- Free hard disk: 4 GB (for database)<sup>1</sup>
- Protocol TCP/IP
- Printer for reports

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<sup>1</sup> Database size depends on many factors such as the number of used data loggers, data archiving period, data hold time, etc. As soon as LoggerSoft is installed, database size is very small, but over time the file will grow. Depending on the intensity of program use, database file size can reach a lot more than indicated in this manual.

## Installation

### General Information and Recommendations

LoggerSoft software consists of client software with a graphical user interface (*LoggerSoft*), and database management system (DBMS), namely an open source Firebird DBMS (*Firebird*).

The installation is done in two stages:

1. Firebird installation
2. LoggerSoft installation.

**ATTENTION!** It is recommended to install software in this order: first, Firebird, then LoggerSoft.

Depending on the need, both programs can be installed either on the same computer or on different computers in a local network. Client software can be installed on multiple computers depending on the number of operators.

**ATTENTION!** Installation of LoggerSoft requires administrator rights.

### Installation Pack Overview

A list of folders and files of LoggerSoft installation pack is shown in Figure 1 and described in Table 1.

Имя	Дата изменения	Тип	Размер
Drivers	09.08.2014 10:52	Папка с файлами	
Firebird	09.08.2014 10:52	Папка с файлами	
InstallDBHelper	09.08.2014 10:52	Папка с файлами	
LS	09.08.2014 10:52	Папка с файлами	
Manual	09.08.2014 10:52	Папка с файлами	
autorun.inf	21.10.2010 19:06	Сведения для уст...	1 КБ
run.exe	03.02.2003 15:27	Приложение	484 КБ
setup.bat	21.10.2010 18:35	Пакетный файл ...	1 КБ
setup.dbd	22.01.2014 16:37	Файл "DBD"	442 КБ
setup.txt	06.03.2014 13:13	Текстовый докум...	8 КБ

Figure 1. Overview of LoggerSoft Installation Pack

Table 1. A list of folders and files of LoggerSoft installation pack

Drivers	Folder with drivers
Firebird	Folder with Firebird installation files
InstallDBHelper	Folder with database template and Firebird configuration wizard
LS	Folder with LoggerSoft installation files
Manual	Folder with program documentation
setup.bat	Batch file, with the help of which you can run the startup disk interface

setup.dbd setup.txt run.exe autorun.inf	Other files needed for startup disk interface.
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## Interface Startup of Installation Disk

The installation is recommended to perform via interface startup of installation disk (see Figure 3). To access this interface, run **setup.bat** batch file which is in the root of the installation pack (see Figure 1).



Figure 2. Startup disk interface (Language)

Startup interface begins with language selection (see Figure 2). Select your language from the list and click "OK". The **Main Menu** will open.



Figure 3. Startup disk interface (Main Menu)

Menu interface consists of a few options. Their description is presented in Table 2.

**Table 2. Menu of startup disk interface**

Install	Goes to the <b>Install Submenu</b>
Browse	Opens the installation pack folder in Windows Explorer
Our site	Opens TERA's website in a browser
Contacts	Shows TERA's contact details
Quit	Closes startup interface

To start the installation, choose the **Install** option which opens the **Install Submenu** (Figure 4). This menu contains two items: Firebird and LoggerSoft. Each of them corresponds to one of the programs, and starts installing the program.



**Figure 4. Interface startup disk (Install Submenu)**

## ***Firebird***

Firebird should be installed on a PC with a reliable hard drive. This computer will store the file database.

After starting the Firebird installation, the following dialog box will appear. Select the language when prompted for a language selection (Figure 5).



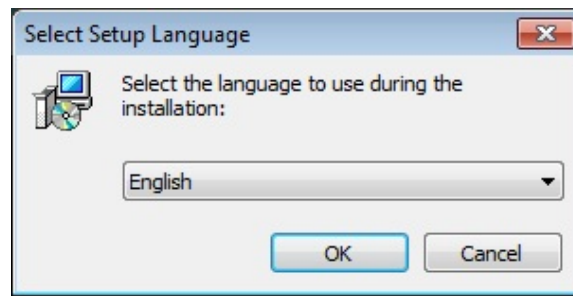


Figure 5. Installing Firebird - Select Language

The **Welcome to the Firebird Setup Wizard** window will appear (Figure 6). This is the first step of the installation. Click **Next**.



Figure 6. Installing Firebird - Step 1

The **License Agreement** is Step 2 (Figure 7). Choose **I accept the agreement** and click **Next**.

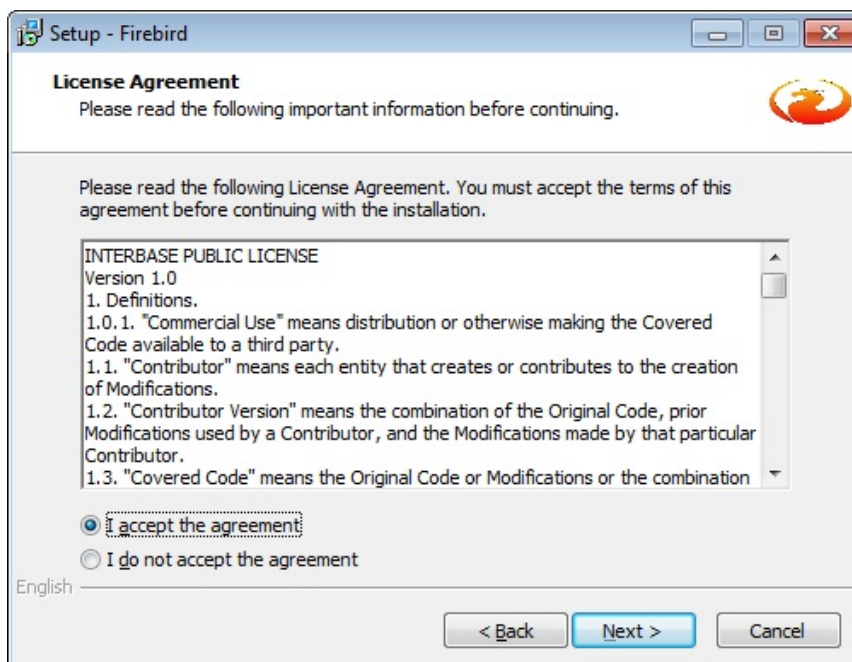
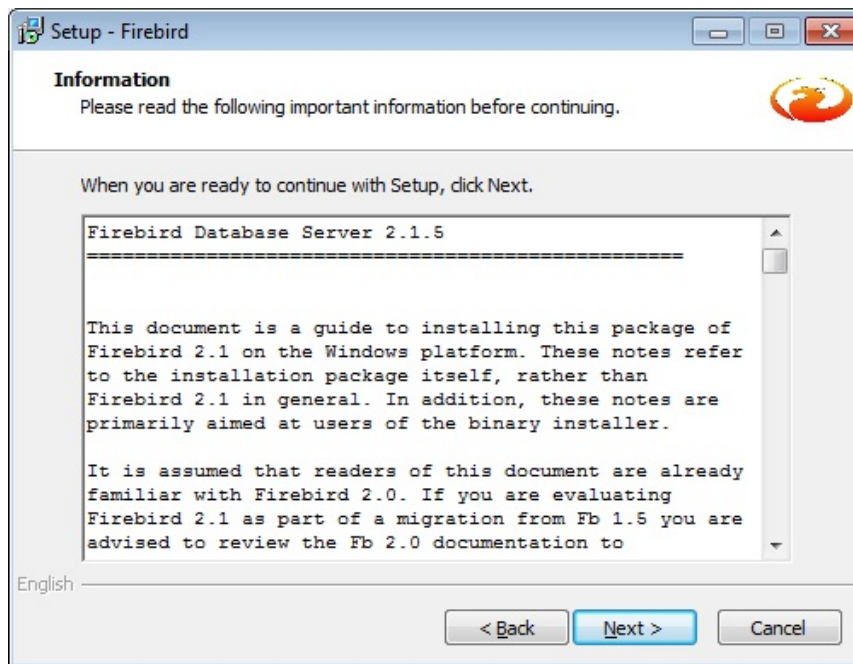


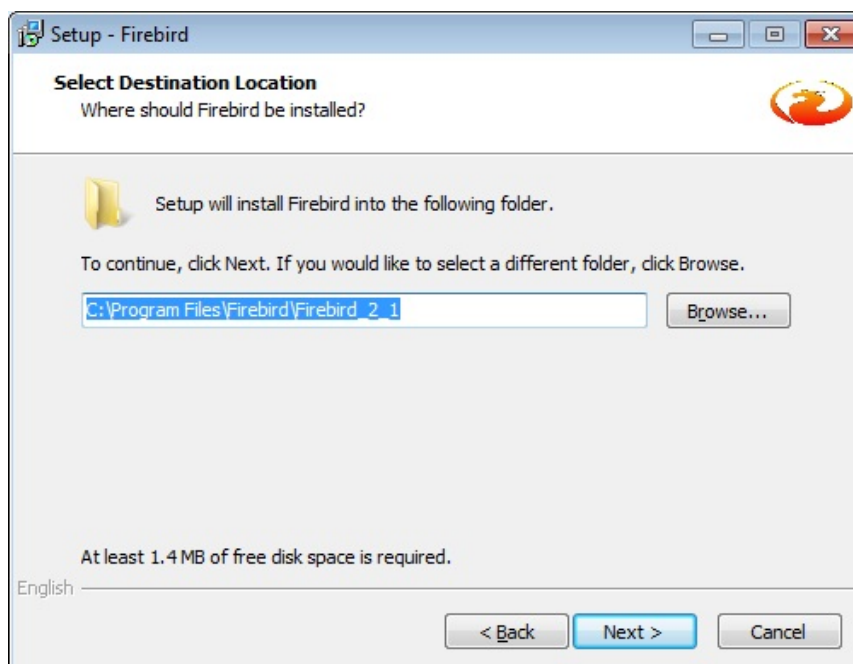
Figure 7. Installing Firebird - Step 2

In Step 3 the information about installation is provided (Figure 8). To continue, click **Next**.



**Figure 8. Installing Firebird - Step 3**

The next step provides a choice of installation directory (Figure 9). In most cases there is no need to change it. Simply click **Next**.



**Figure 9. Installing Firebird - Step 4**

Step 5 allows you to choose which program components to install (Figure 10). By default this is a full install version and **Super Server** binaries. In most cases, this is the best choice. However, if you are not connected to the local network, it makes sense to choose **Classic Server** binaries. In this case, the database will work more efficiently. Click **Next** to move to another step.

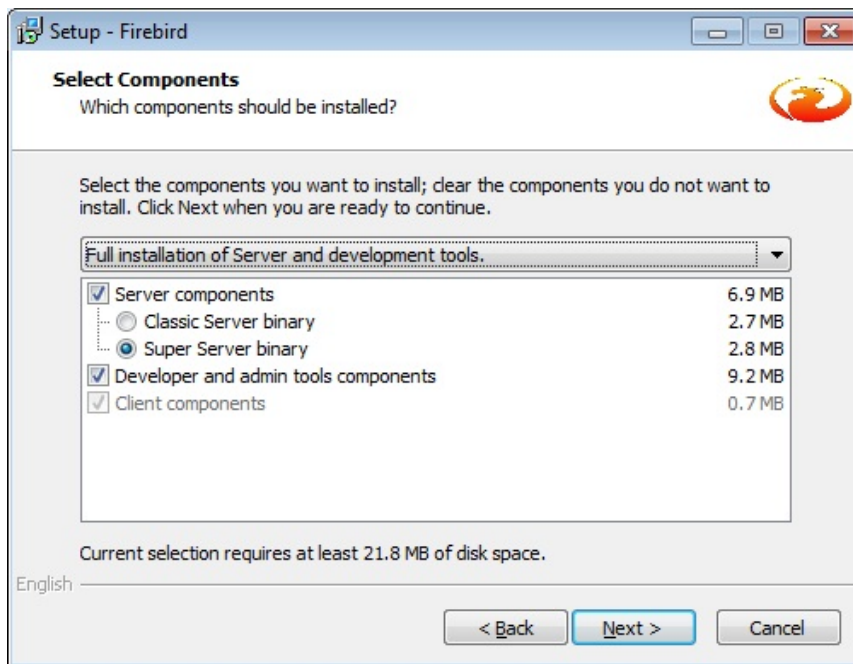


Figure 10. Installing Firebird - Step 5

Step 6 allows you to select a folder in the **Start Menu** to place the shortcuts (Figure 11). Name, which is offered by default, is quite acceptable. To continue, click **Next**.

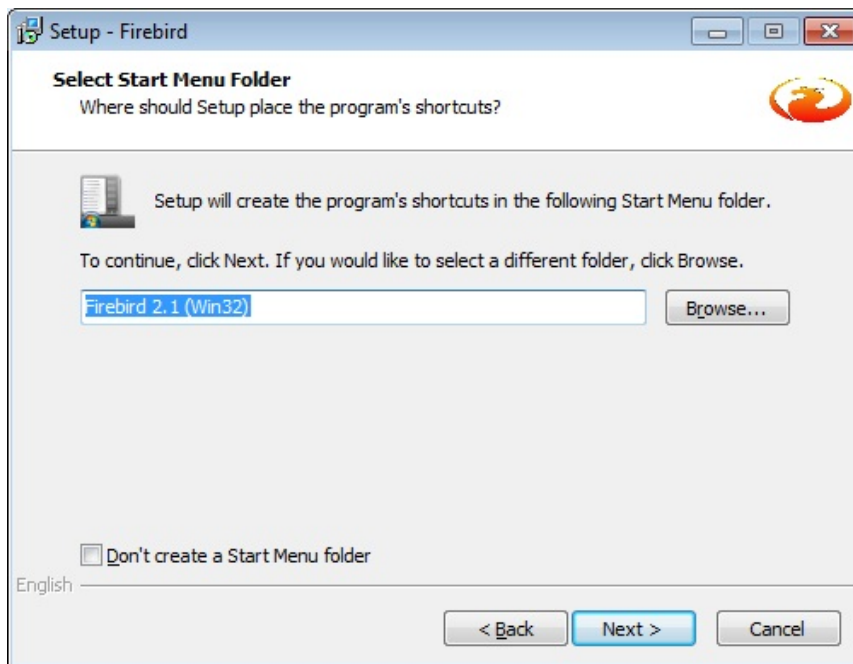
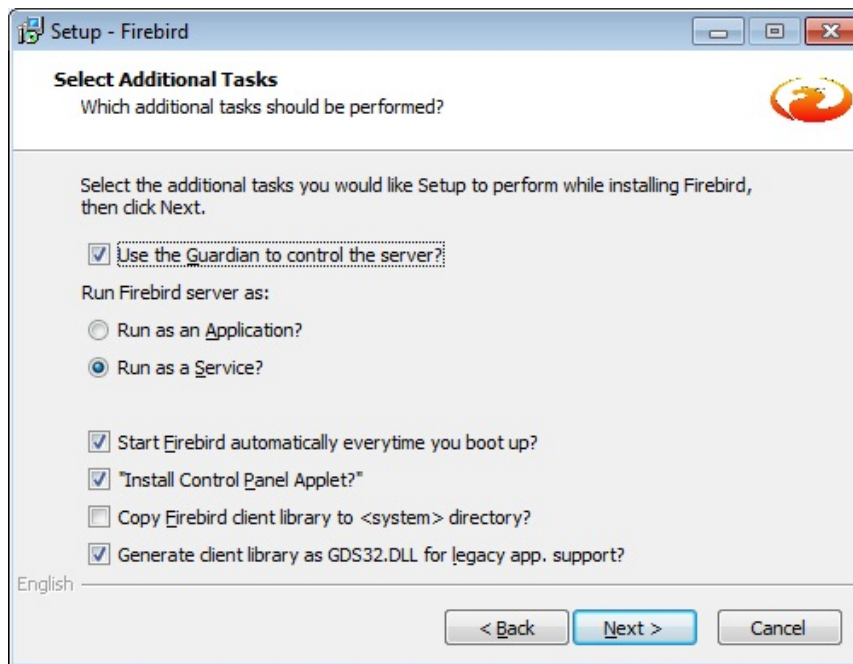


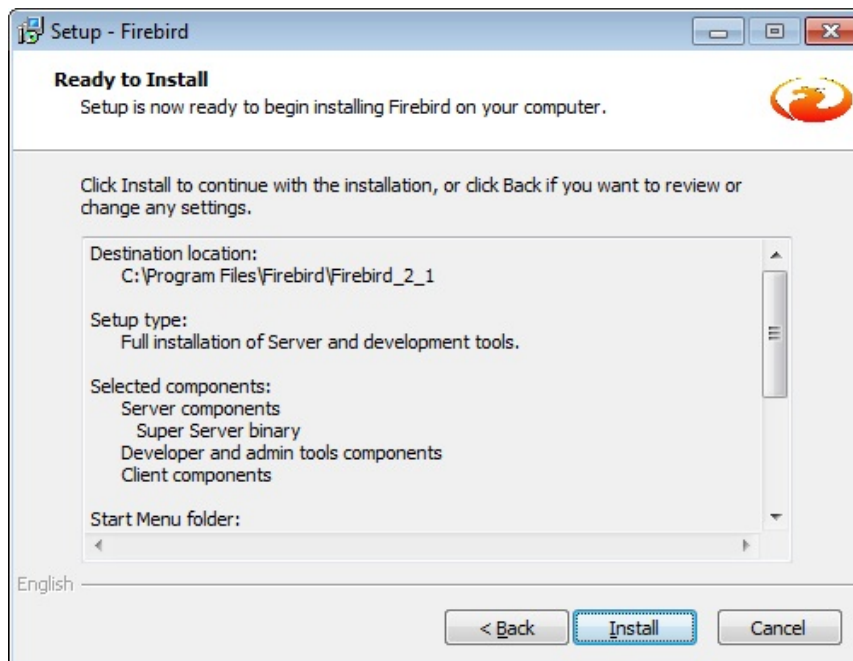
Figure 11. Installing Firebird - Step 6

Step 7 is the choice of additional post-installation tasks (Figure 12). All necessary parameters are selected by default. To change anything is not necessary. Just click **Next**.



**Figure 12. Installing Firebird - Step 7**

Step 8 is the page which shows all the selected installation options (Figure 13). If there was a mistake somewhere in your choice, you can go back to that page and fix it. If everything is correct, then click **Install** to start the installation process.



**Figure 13. Installing Firebird - Step 8**

Step 9 offers to review the information for your Firebird (Figure 14). To continue, click **Next**.

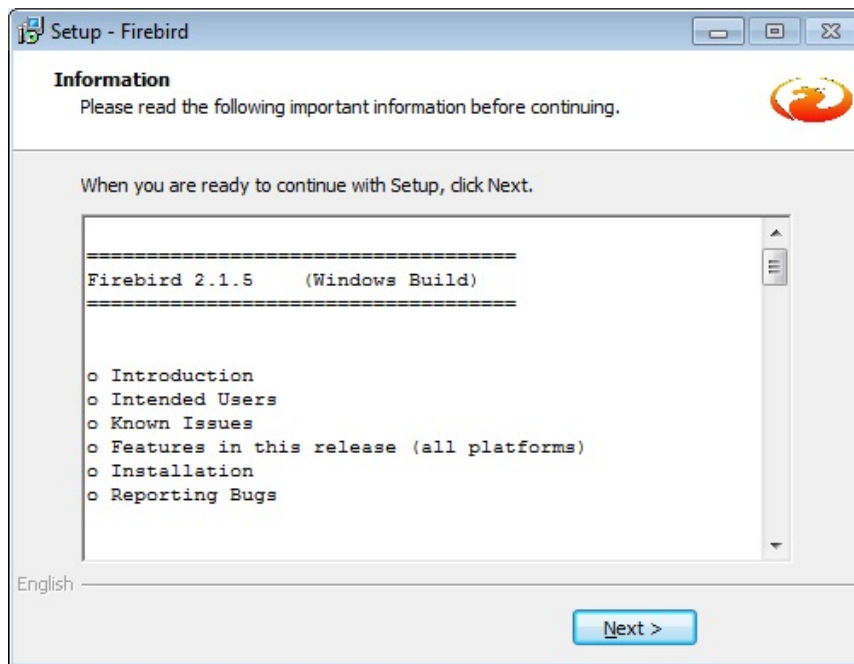


Figure 14. Installing Firebird - Step 9

Step 10 is the final step of installation (Figure 15). It displays information about the installation and offers two tasks to perform after the wizard has been completed. Check **Start Firebird Service now?** box and uncheck **After installation - What Next?** box. To complete the wizard, click the **Finish** button.



Figure 15. Installing Firebird - Step 10

The Firebird is now installed on your PC.

## ***Firebird Configuration Wizard for LoggerSoft***

For LoggerSoft operation, it is necessary to create the database and configure Firebird. To facilitate this process, **Firebird Configuration Wizard** program is used (Figure 16). This program is

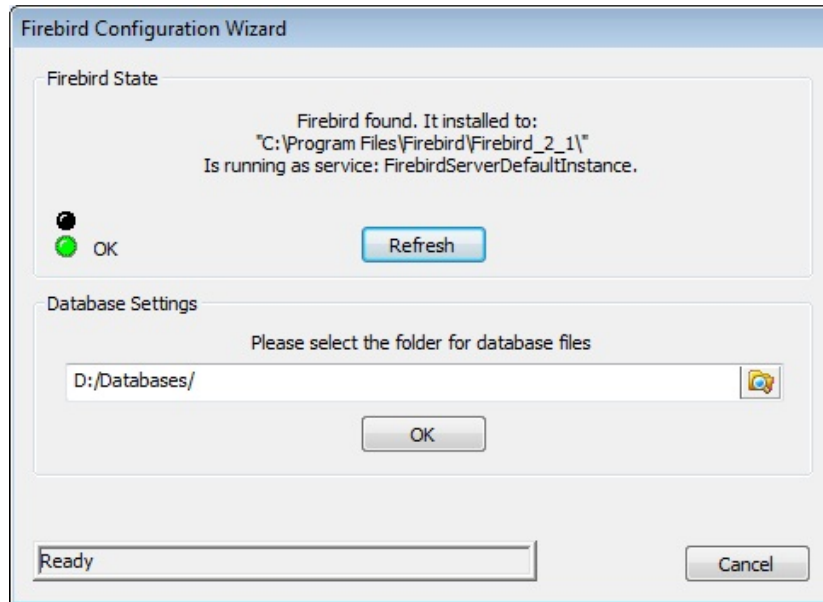


launched automatically after the Firebird has been installed, if Firebird installation was launched via startup disk.

If the wizard does not start automatically, it must be run manually. To do this, open the folder in the **InstallDBHelper** root directory and double-click the **idh.exe**.

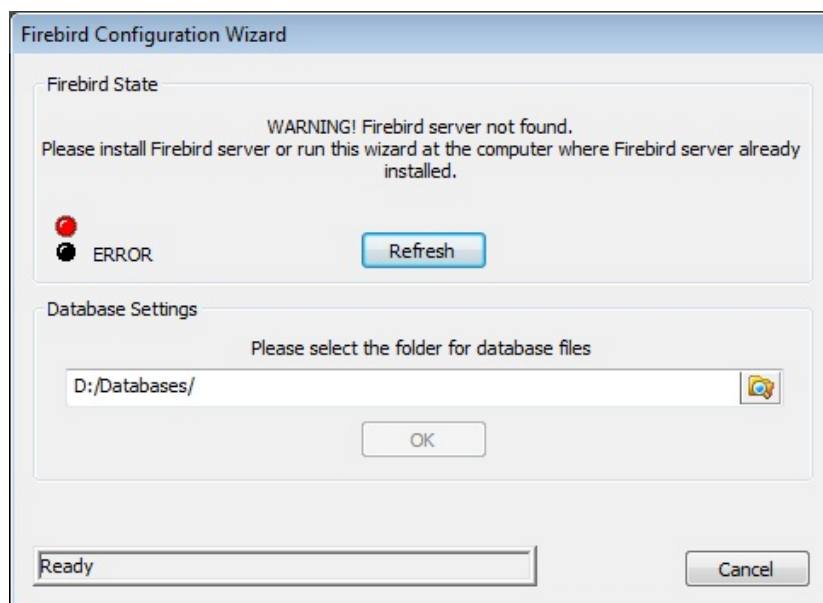
The Wizard creates the necessary databases and configures Firebird to operate with them.

The upper part of the Wizard window displays the Firebird state. If the server is OK, the green LED labeled **OK** lights (Figure 16). If there is a problem with the server, the red LED labeled **ERROR** lights (Figure 17). In this case, you should pay attention to the message and fix the problem.



**Figure 16. Firebird Configuration Wizard**

In the central part of the wizard the user specifies the folder for the database files. By default, it is **Databases** folder on the **D:** drive. Optionally, you can specify a different folder, however, it is strongly recommended not to choose a folder on the **C:** drive (system drive). As when reinstalling the operating system, most likely, these files will be lost.



**Figure 17. Firebird Configuration Wizard (ERROR)**

To make the Wizard perform all the necessary actions, click **OK**. The installation progress will be displayed in the bottom part of the window. After that the **Finish** button will appear. Click it to complete the Wizard.

If there is the **LoggersDB.FDB** database file in the specified folder, it shows the correct Wizard operation.

## LoggerSoft

The **LoggerSoft** is client application for working with the file database in a user-friendly interface. The program is installed on a PC.

To install the **LoggerSoft**, first select the language and click **OK** (Figure 18).



Figure 18. Installing LoggerSoft - Select the language

After that the **Welcome Wizard** window opens (Figure 19). This is the first step of the installation. Click the **Next** button.

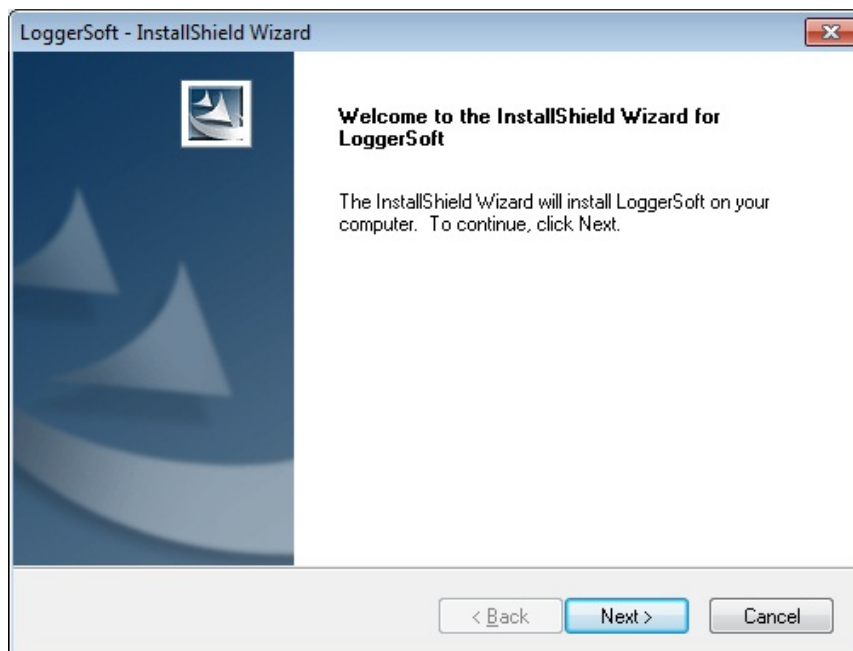
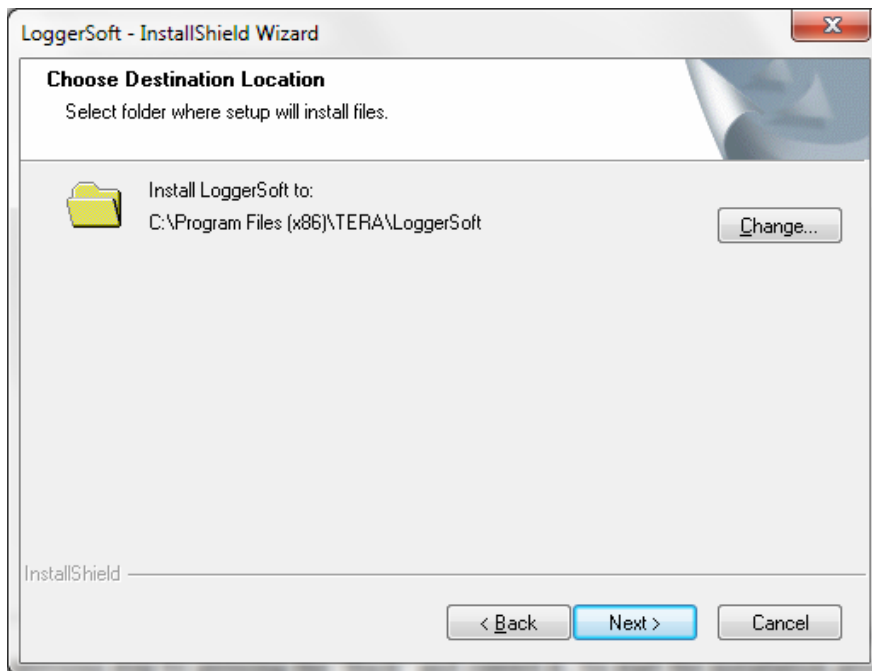


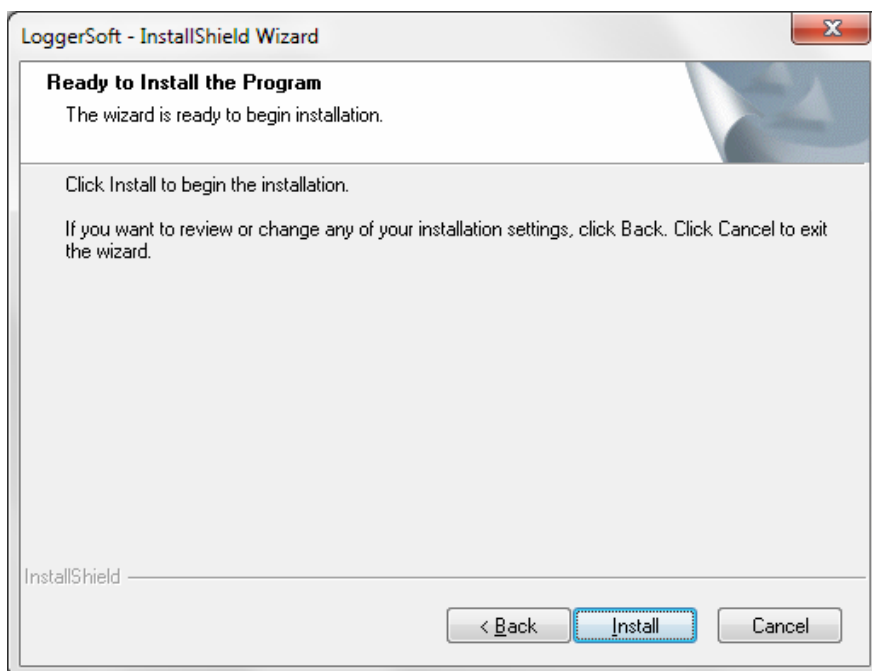
Figure 19. Installing LoggerSoft – Step 1

Step 2 chooses a destination folder (Figure 20). By default, it is installed in the folder **C:\Program Files\TERA\LoggerSoft**. In most cases, there is no need to change the destination folder, however, if you still want to do it, click **Change...** To continue, click **Next**.



**Figure 20. Installing LoggerSoft – Step 2**

Step 3 is overview of the selected installation options (Figure 21). If there is a mistake, go back to the previous step by clicking the **Back** button and correct it. To start the installation process, click **Install**.



**Figure 21. Installing LoggerSoft – step 3**

Step 4 shows the results of installation (Figure 22). Click **Finish** to complete the installation.



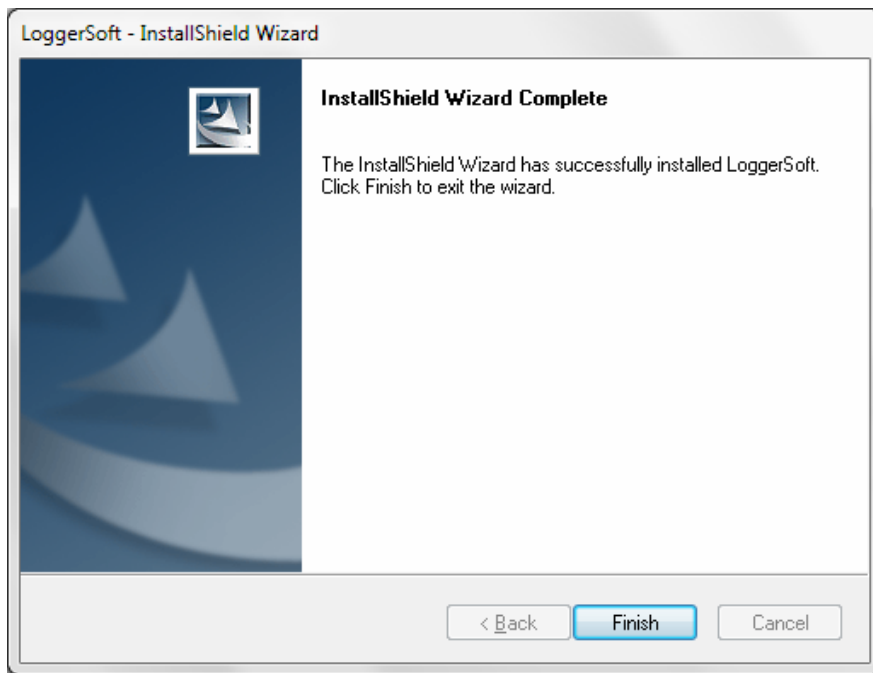


Figure 22. Installing LoggerSoft – Step 4

## Description of LoggerSoft Interface

The main program window of LoggerSoft is shown in Figure 23. It is possible to identify eight major panels:

1. Main Menu Bar
2. Standard Toolbar
3. Loggers and Labels Panels
4. Recorded Data Control Panel
5. Data Display Area
6. Downloaded Data Panel
7. Log Output Panel
8. Status bar

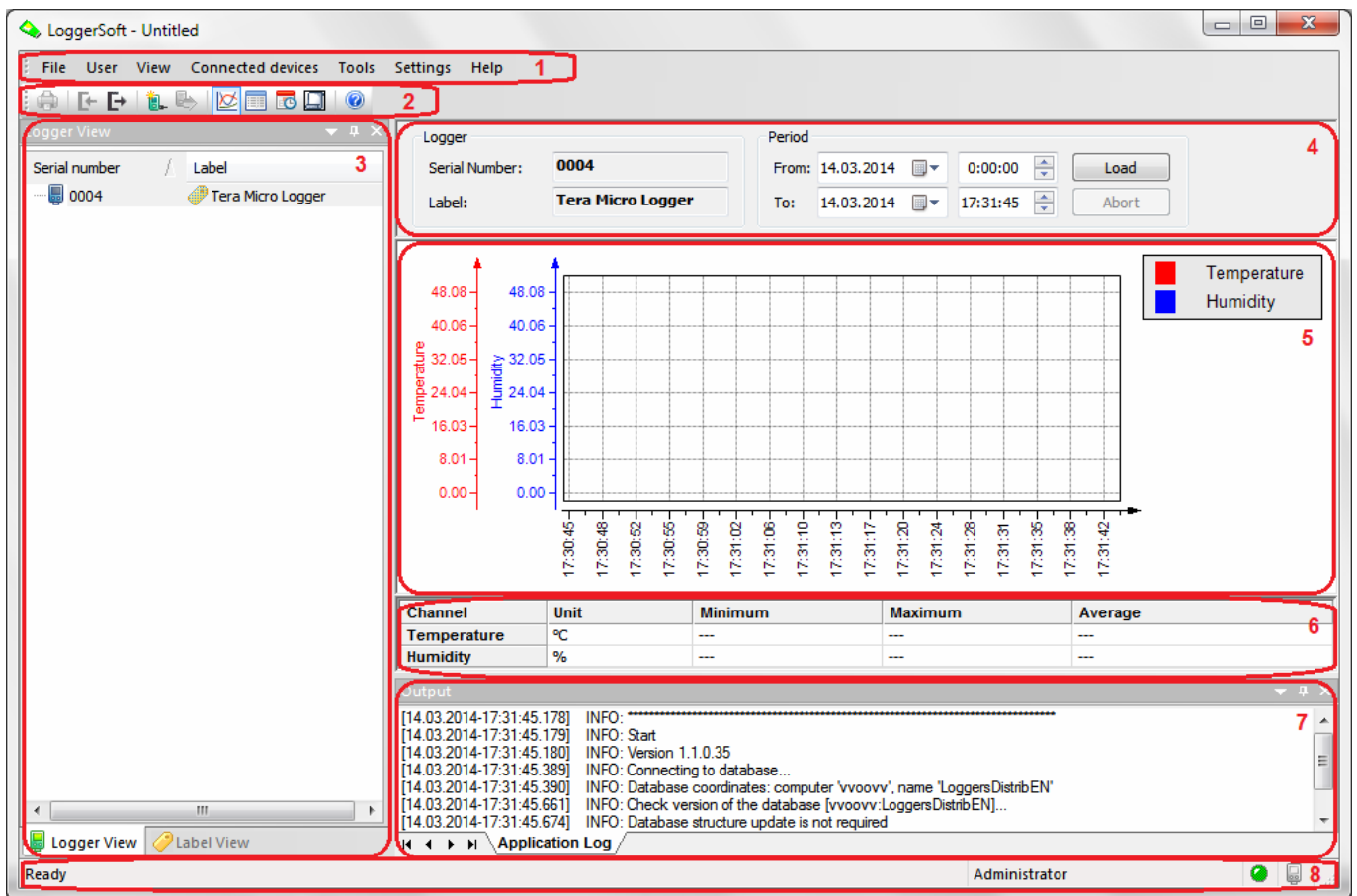


Figure 23. The main program window of LoggerSoft

### Main Menu Bar

#### File Menu

Table 3. File Menu Options

Option	Description
Print...	Opens a standard print dialog box
Print Preview	Opens print preview
Print Setup...	Opens a standard print setup dialog box
Exit	Closes the program

## User Menu

**Table 4. User Menu Options**

Option	Description
Login	Opens a login dialog box
Logout	Logs the current user out of the program
Change Password	Changes the password of the current user

## View Menu

**Table 5. View Menu Options**

Option	Description
Toolbars and Docking Windows	Contains a dropdown menu with a list of toolbars and docking windows that can be hidden: <ul style="list-style-type: none"> <li>✓ Standard</li> <li>✓ Data Loggers View</li> <li>✓ Labels View</li> <li>✓ Output</li> </ul> Options in this menu hide/open the relevant panels or windows
Graph	Presents data in a graph
Table	Presents data in a table
Device Event Log	Opens the data logger Event Log
Report	Presents data in a report
Status Bar	Hides/Opens Status bar

## Connected Devices Menu

This menu changes dynamically depending on the connected devices. If no devices connected, the menu contains options presented in Table 6. If one device is connected, the menu is completed by the options from Table 7. If multiple devices are connected, a dropdown menu with options in Table 7 is created for each of devices.

**Table 6. Connected Devices Menu Options**

Option	Description
Search for Connected Devices	Starts a search for connected devices

**Table 7. Options to Work With Device**

Option	Description
Download Data...	Opens a dialog box for downloading data from a device
Settings...	Opens a device configuration dialog box
Time Synchronization	Synchronizes a device and computer time
Battery Replacement...	Replaces a device battery
Clock Calibration...	Calibrates a device clock
Calibration of Measurement Channels...	Opens a dialog box for calibrating measurement channels

## Tools Menu

**Table 8. Tools Menu Options**

Option	Description
User Event Log	Opens a user Event Log
Search for Connected Devices	Starts a search for connected devices

## Settings Menu

**Table 9. Settings Menu Options**

Option	Description
Database...	Opens a dialog box of database settings
User Rights...	Opens a dialog box of administrative user rights
Supported Device Types...	Displays a list of supported device types
Language	Shows a dropdown menu with a list of available interface languages

## Help Menu











**Table 10. Help Menu Option**

Option	Description
About LoggerSoft...	Displays information about the <b>LoggerSoft</b> software

## Standard Toolbar

The Standard Toolbar duplicates some of the options of the main menu bar for quick access. A list of these options is shown in Table 11.

**Table 11. Standard Toolbar Options**

Button	Option	Description
	Print...	Opens a standard print dialog box
	Entry	Opens a dialog box of user login
	Exit	Logs a current user out of the program
	Search for Connected Devices	Starts searching for connected devices
	Download Data...	Opens a dialog box for downloading data from a device
	Graph	Presents data in a graph
	Table	Presents data in a table
	Logger Event Log	Opens a logger Event Log
	Report	Presents data in a report
	About LoggerSoft...	Displays information about the <b>LoggerSoft</b> software.

If the current panel is disabled, open it again via **View** → **Toolbars and Docking Windows** → **Standard**.

## Data Loggers View and Labels View Panels

Both panels display a list of data loggers which are in the database, but with a different method of sorting. The **Data Loggers View** panel focuses on sorting and searching a data logger by its serial number. The **Labels View** panel is designed to display data loggers sorted by their text label. Both panels indicate a serial number and a text label in separate columns. You can change the sort direction by clicking on the header of the columns.

If the panels are disabled, open them again via **View** → **Toolbars and Docking Windows** → **Data Loggers View / Labels View**.

To view the recorded data, double left-click the data logger in the list of any of these panels. The data of the selected data logger will appear on the **Recorded Data Control** panel.

Right-click the item in the list to open its context menu. There are context menus of data loggers and text labels there.

## Data Logger Context Menu

This context menu appears by right-clicking the data logger item in the **Label** and **Loggers** panels. List of options in this menu is shown in Table 12.

**Table 12. Data Logger Context Menu Options**

Option	Description
Download Data...	Opens a dialog box for downloading data from a device
Settings...	Opens a device configuration dialog box
Time Synchronization	Synchronizes a device and computer time
List of Logical Parameters...	Opens a window with the list of logical device parameters
Battery Replacement...	Replaces a device battery
Clock Calibration...	Calibrates a device clock
Calibration of Measurement Channels...	Opens a dialog box for calibrating measurement channels
Delete	Deletes the selected data logger from the database. <b>NOTE.</b> It is forbidden to remove the data logger which is currently connected to the PC.

## Text Label Context Menu

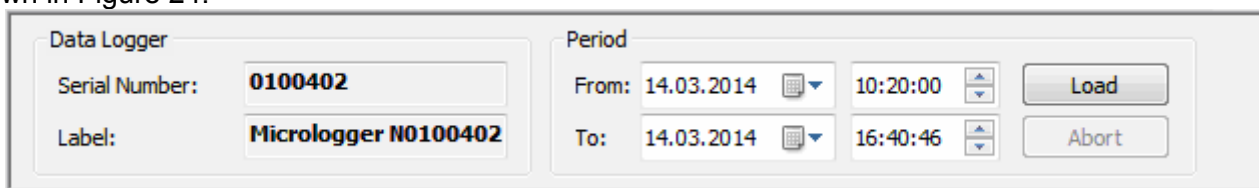
This context menu appears by right-clicking the text label item in the **Label** panel. List of options in this menu is shown in Table 13.

**Table 13. Text Label Context Menu Options**

Option	Description
Create	Creates a new text label
Delete	Deletes the selected text label from the database <b>NOTE.</b> It is forbidden to delete both the text label connected to the logger and <b>&lt;No labels&gt;</b> item.

## Recorded Data Control Panel

This panel is designed to view the recorded data in the database. The example of the panel is shown in Figure 24.



**Figure 24. Recorded Data Control Panel**

The **Logger** section displays information about the data logger, which is selected for viewing, namely, its serial number and text label.

The **Period** section contains the control elements for selecting the time period to view the data.

The **Load** button initiates the data loading for a specified time interval from the database. Both the recorded data and the Event Log of the selected data logger are downloaded. Download process is displayed in the status bar. After the process is completed, the data will be displayed in the **Data Display Area** in the form that is currently selected.

The **Abort** button interrupts the download process.

## Data Display Area

This is the window which displays the data downloaded from the database. Such data can be presented in several forms, namely in the form of a graph, a table or a record. Also, this window displays the data logger Event Log. Choose the type of information view by using the options of **View** menu or by pressing the buttons of the **Standard** toolbar.

### Graph

The graph shows how the parameters change during the specified time. The graph example is shown in Figure 25.

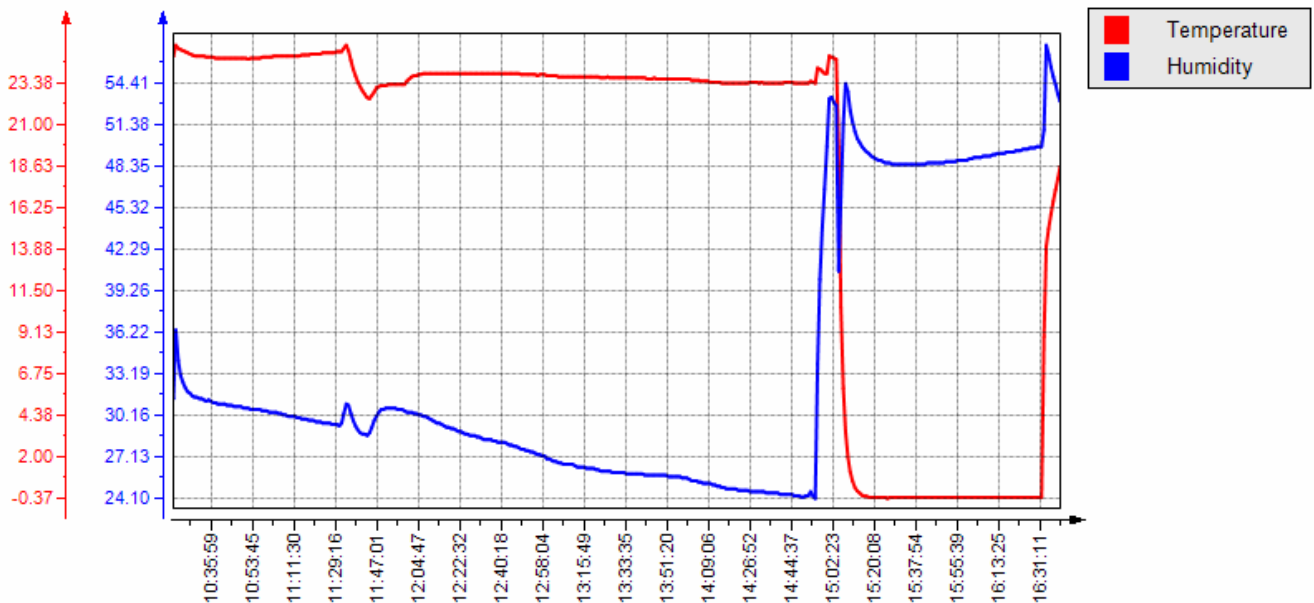


Figure 25. Graph Example

The symbols area shows the names of data logger logical parameters with reference to the color of the pen, with which a graph of this parameter is drawn. If hover the mouse over the symbols area, the >> pop-up button will appear. Click it to open the checkboxes of displaying channels. If uncheck the checkbox, the graph of the appropriate channel will not be displayed (see Figure 26).

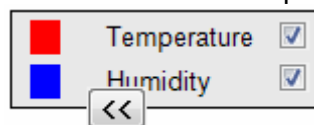


Figure 26. Symbols Area

The graph always contains one X-axis, the axis of time. There can be several axes, depending on the number of different units of measurement which are used by the data logger.

Each axis can operate either in the auto scale or specified scale mode. By default, the auto scale mode is used. To change the axis scale, drag the axis by left-clicking up or down. If pulling up, the scale increases. If pulling down, the scale decreases. To return to the auto scale mode, hover over the axis and click the **Auto Zoom** pop-up button.

It is also possible to zoom in any part of the graph for more detailed viewing with the help of the mouse. Hold down the left mouse button while dragging out the area of interest from left to right, and then release the button. After that, the selected area will be extended to the whole screen of the graph. To zoom out, stretch the frame from right to left. In addition, it is possible to change the scale using the mouse wheel (the third mouse button).

It is possible to move the graph using the right mouse button. In this case, if the cursor is over a graph area, the graph will be moved on all axes simultaneously. If the cursor is over the particular axis, the graph will be moved on this axis.

After each graph moving or axis zoom, the **Restore** button appears in the bottom of the graph. Click on this button to return to the initial position.

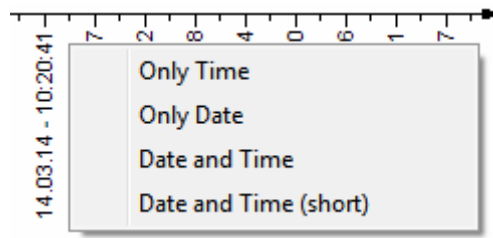


Figure 27. Time Axis Context Menu

Date format on the time axis can be changed so that it was the most informative. To do this, right-click the context menu on the time axis and choose the desired format (see Figure 27).

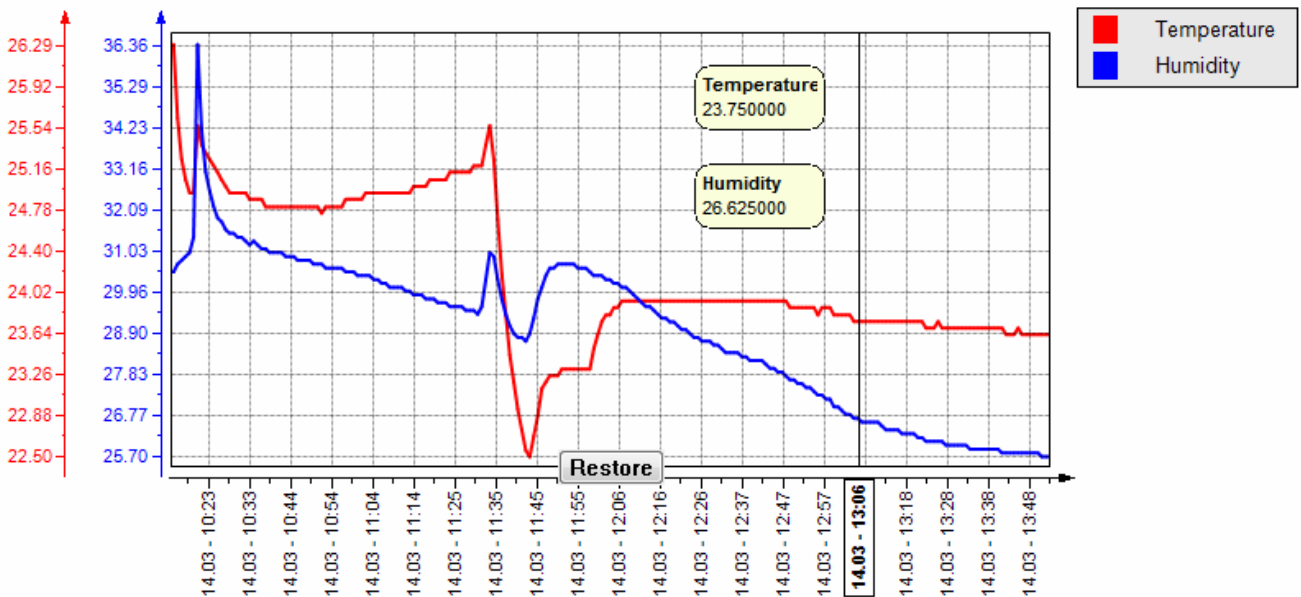


Figure 28. Cursor on the Graph

For a detailed analysis of the data it is possible to set the cursor by double clicking on the graph (Figure 28). The cursor is a vertical line with a time label and small windows, which contain the values per each channel at this time. Windows with values can be moved with the mouse.

The cursor can be moved left/right with the mouse. To move the cursor, click the context menu over it and select **Remove the cursor**.

### Table

Presenting information in tabular form also allows tracking the changes of the parameters.

Table columns are logger measurement channels, and table lines are channel parameter values at certain times. The left column contains date and time of each row. The column headings contain the names of logical parameters and their measuring units. The table example is shown in Figure 29.

Date and Time	Temperature, °C	Humidity, %
13.03.2014 14:41:00	28.94	45.60
13.03.2014 14:41:10	28.63	45.60
13.03.2014 14:41:20	28.38	45.50
13.03.2014 14:41:30	28.19	45.50
13.03.2014 14:41:40	28.00	45.50
13.03.2014 14:41:50	27.81	45.40
13.03.2014 14:42:00	27.63	45.40
13.03.2014 14:42:10	27.50	45.40
13.03.2014 14:42:20	27.38	45.40
13.03.2014 14:42:30	27.25	45.30
13.03.2014 14:42:40	27.13	45.30
13.03.2014 14:42:50	27.00	45.30
13.03.2014 14:43:00	26.88	45.30
13.03.2014 14:43:10	26.75	45.30

Figure 29. Table Example

This table can be exported to the file (please refer to **Data Export**).

## Logger Event Log

Data logger Event Log allows to answer some questions in situations when no graph, no table can give the full picture. Also, the Event Log provides explanations in case of failures. If it is necessary to know the exact time of the event, the Event Log should be used.

The Event Log example is shown in Figure 30. List of events is presented in tabular form. The table has two columns. The left column contains date and time of events. The right column contains a text description of the event.

Date and Time	Event Description
08.09.2014 12:06:43	Logger setup
08.09.2014 12:06:43	Start of logging. Alarms ON

Figure 30. Event Log Example

This table can be exported to the file (please refer to **Data Export**).

## Report

Before printing, view the format and content of the report. If necessary, the format can be changed. The report example is shown in Figure 31. The report consists of a header, a summary data table, a recorded data table and a graph. The report header specifies the data logger text label and serial number, the beginning and the end of the reporting interval, and logging period.

When viewing the report, the **Report Options** toolbar opens to the left of the report. The panel has control elements for changing the report format.

The **Page Setup...** button opens a dialog box for editing the parameters of the report page (see Figure 32).

The **Included in the Report** section contains checkboxes: **Table**, **Event Log** and **Graph**.

The **Channels** section contains a list of checkboxes of measurement channels.



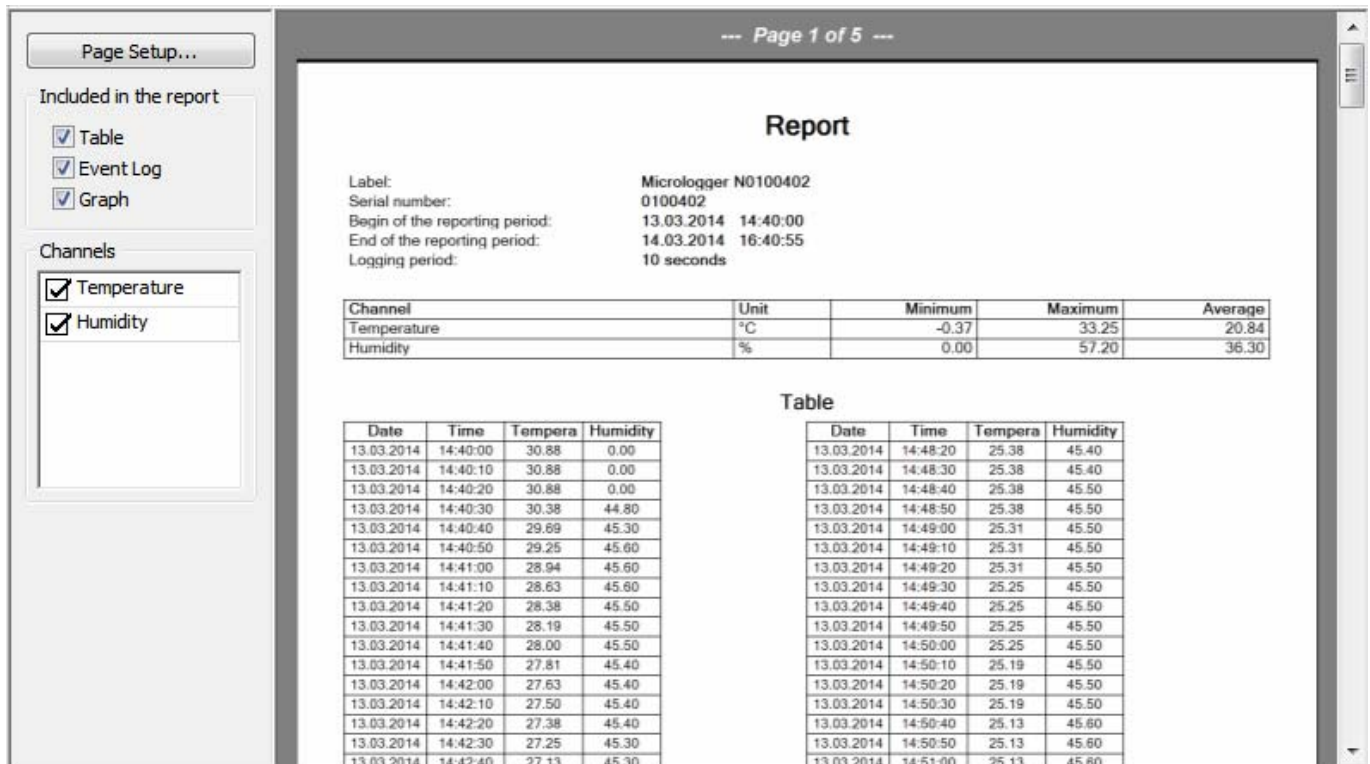


Figure 31. Report Example

The **Page Setup** dialog box allows changing the page orientation and reporting margins (Figure 32).

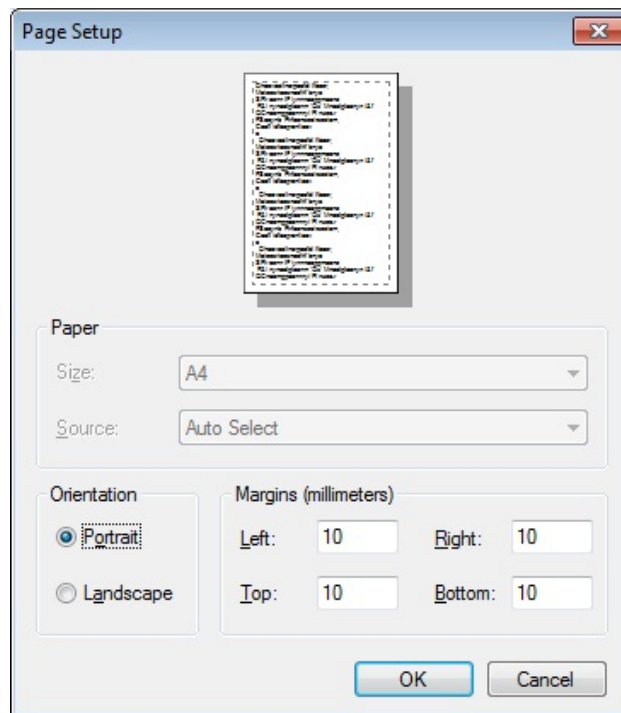


Figure 32. Page Parameters

### Downloaded Data Panel

This panel is presented on the screen if graph, table or device Event Log is selected for displaying the data (Figure 33). If report is selected, this panel is hidden.

Panel provides information in the form of a summary table based on data that is loaded from the database at the moment. Table rows are data logger measurement channels. The columns are: unit, minimum, maximum and average.

Channel	Unit	Minimum	Maximum	Average
Temperature	°C	-0.37	25.56	18.075
Humidity	%	24.1	57.2	33.7472

**Figure 33. Downloaded Data Panel**

## ***Log Output Panel***

This panel displays the program Log. It is a text file which is located in the program folder. Recording to the file is duplicated on-screen.

The program Log can be useful for analyzing the causes of errors or the results of user actions. It contains details of user operations.

If this panel is hidden, open it again via **View** → **Toolbars and Docking Windows** → **Output**.

## ***Status Bar***

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

- current status or tip about the menu command
- long-acting process indicator
- current user name
- database connection indicator
- connected devices indicator

Depending on the specific situation, other information may additionally be displayed in the status bar.

When hovering over the individual sections of the status bar, tooltips containing more detailed information appear.

If there is no connection with database, left double-click the indicator to reconnect. The dialog box will display the list of connected devices.

If the status bar is disabled, open it again via **View** → **Status Bar**.

## Working With LoggerSoft

### Starting the Software

To start the LoggerSoft software, use the **LoggerSoft** shortcut on the desktop or via **Start** → **All Programs** → **TERA** → **LoggerSoft** → **LoggerSoft**. After starting the main window opens (see Figure 23).

When the user first start the program, he may see a message saying that he cannot connect to the database. In the status bar the database connection indicator will be red. This situation can occur 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 launched. In this case, it is necessary to install, configure or launch **Firebird** (please refer to **Firebird** and **Firebird Configuration Wizard for LoggerSoft** paragraphs). Second, if the database is on another computer. In this case, check and change the database settings (please refer to **Database** paragraph). Once the connection with the database is restored, the indicator in the status bar turns green and loads a list of loggers that are in the database.

The program is ready to be used. You can perform a number of actions that do not require authorization, such as search for connected devices, download data from a data logger, view the downloaded data, print reports, view current data logger settings. To perform other actions, such as change settings of a data logger or a program, remove loggers from the database, etc., it is required to log into the program (please refer to **User Login/Logout** paragraph).

### User Login/Logout

To enter the program, use the **User** → **Login main menu**. This command opens an authorization dialog box, shown in Figure 34. Enter login (or username) and password, then press the **Enter** button. If the data is entered correctly, the dialog closes and the status bar displays the name of the logged in user.

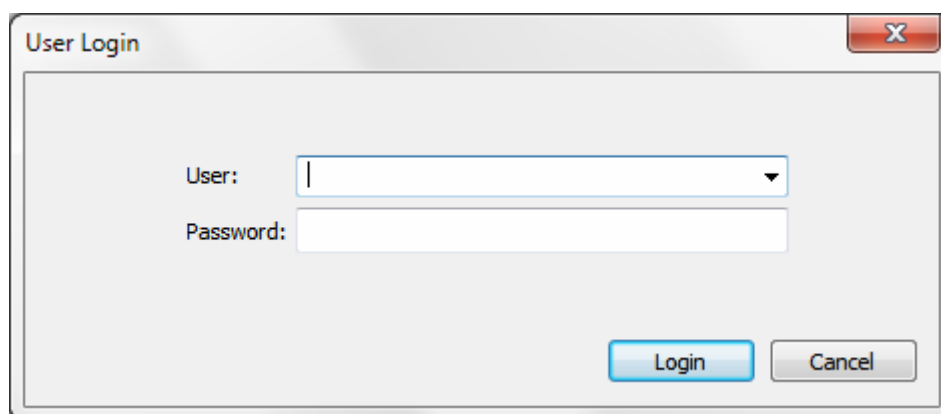


Figure 34. User Login

The **User** field on the dialogue is designed as a drop-down list. This makes it possible to enter a username from the keyboard or select it from the list. The list contains all the users which are in the database.

**NOTE.** After the program is installed, there is only one user, **Administrator**. The password for this user is not specified. The user is used to administer the user rights and program settings.

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

To exit the program, use **User → Logout main menu**. Once the user is logged out, the status bar indicates **Login failed** line.

## Changing the User Password

Any user can change his password. Besides, the password of any user can be changed by a user with permissions of administration of user rights (please refer to **Administration of user rights**).

To change his password, the user must log in to the program and use the **User → Change Password** command in the main menu. In response, the **Authorization Check** dialog box opens (Figure 35). Enter the password and click **OK**. If the password is correct, the dialog box closes.

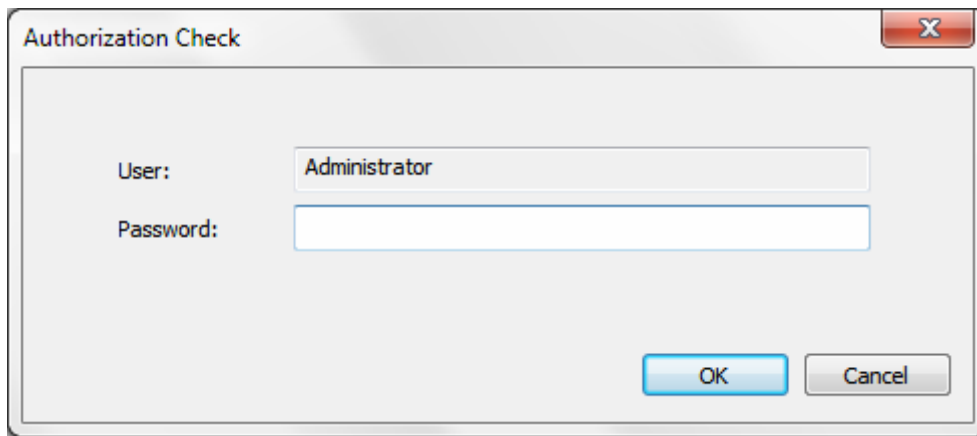


Figure 35. Authorization Check

If the user's authority is confirmed successfully, the **Change Password** dialog box opens (Figure 36).

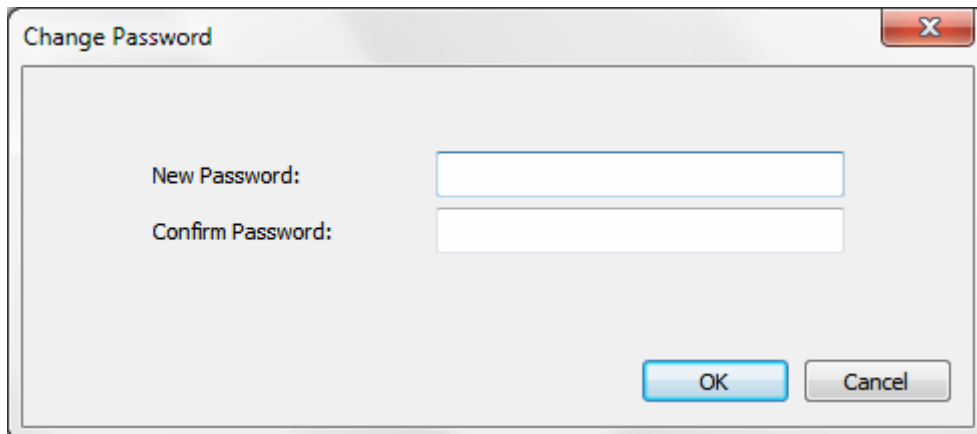


Figure 36. Change Password

Enter the new password twice and click **OK**. If the entered passwords match, the dialog box closes and the message about successful change of password appears.

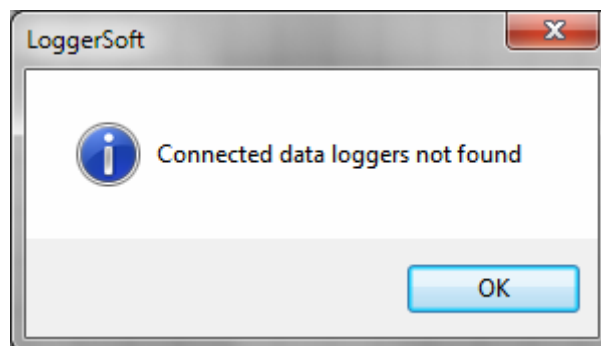
## Search for Connected Devices

To configure a data logger or read the recorded data, it is necessary to establish communication with the data logger and synchronize it with the database. To do this, connect the logger to the PC and use the **Search for connected devices** command. Since this command is used frequently, it is duplicated in several places:

- **Connected devices** main menu
- **Tools** main menu
- **Standard** toolbar

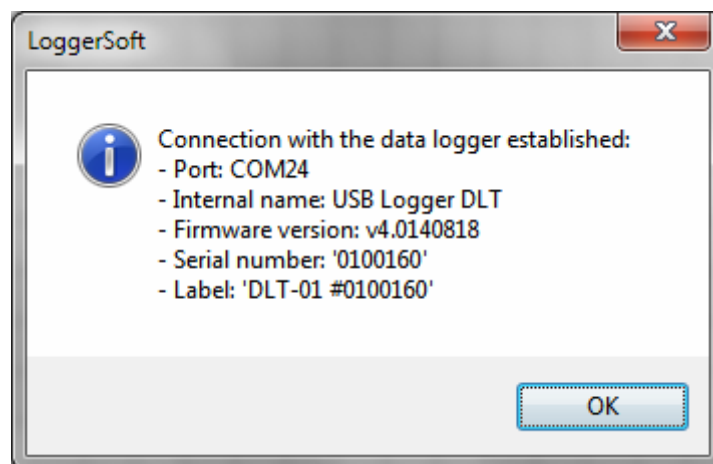
When clicking the **Search for connected devices** command, the program will scan all COM ports that are in the system to determine the connected data loggers. If communication with the logger is installed, the program reads its basic parameters. Searching process is displayed in the status bar and in the window of the program Log. The program will inform about the search results with a message. Since all the ports are scanned, three variants of different messages are possible.

If the connected devices are not found, the program will display the message shown in Figure 37.



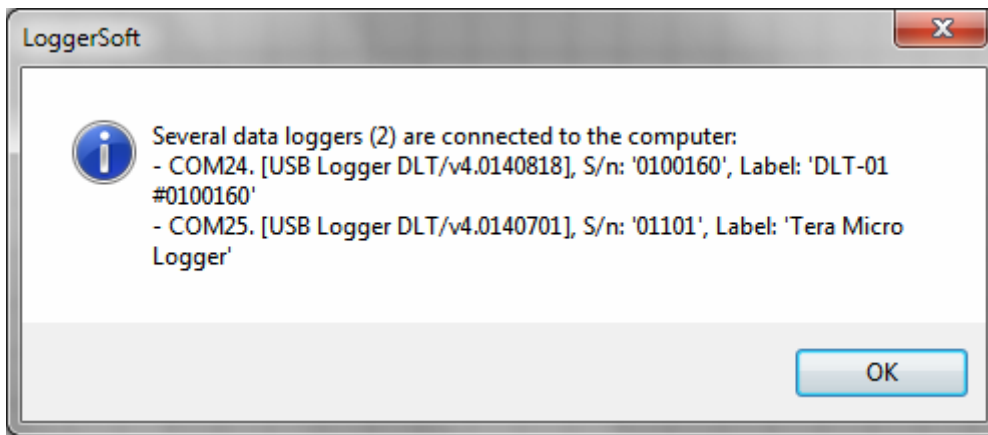
**Figure 37. Report the results. Devices are not found**

If a data logger is connected, the program displays a message, an example of which is shown in Figure 38.



**Figure 38. Report the results. Found one device**

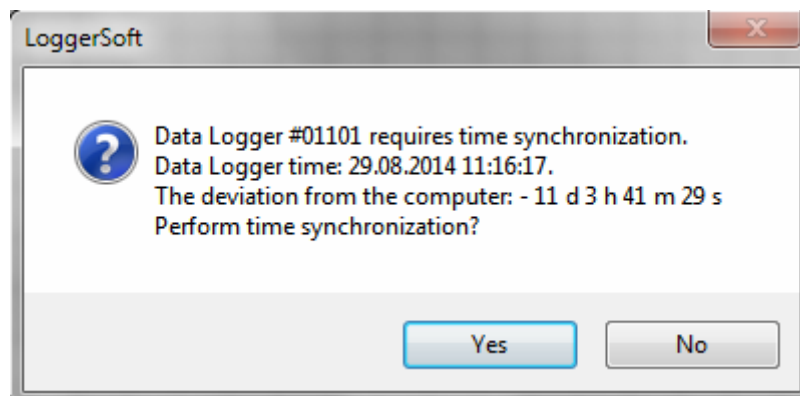
If several devices are connected, the program displays a message, an example of which is shown in Figure 39.



**Figure 39. Report the results. Found several devices**

After communication with the logger is installed, the software synchronizes this logger with the database. The process is also displayed in the status bar and in the window of the Log program. In case of any errors, the program displays a message describing the error.



After synchronization with the database, data logger settings and time are read. If the data logger time deviates from the computer time for more than 5 minutes, the program will ask to synchronize the time. The message will indicate the current logger time and the deviation from the computer time. The example of the message is shown in Figure 40. Click **Yes** to synchronize the time immediately. Click **No** to keep on working without time synchronization. In any case, time can be synchronized later using a special command (please refer to **Time Synchronization** paragraph).



**Figure 40. Request for logger time synchronization**

Once all the steps above are completed, the **Connected Devices main men**, the **Connected Devices indicator** in the status bar and the color of the logger icons on the **Loggers and Labels panels** will change.

If multiple devices are connected, there will be a drop down **Logger №N menu** in the **Connected Devices main menu** for each device. **N** is a serial number of the data logger. If one device is connected, the **Connected Devices menu** will change to **Logger №N**, where **N** is the serial number of the data logger. If there were mistakes during synchronization, some options in the data logger menu will be unavailable.

Depending on the search results, the **Connected Devices indicator** in the status bar will be either gray  (no connected devices) or green /  (connected single/multiple devices).

On the **Loggers and Labels Panels** the color of the data logger icons which are connected and synchronized with the database will also change to green. If there were mistakes during synchronization with the database, the color of the icons remains blue.

## List of connected devices and choice of the current device

If more than one device is connected at a time, than one of them is current. All operations which are performed without specifying the default device are performed in relation to the current device. The example of such operation is reading data from the logger, launched by pressing the button on the **Standard toolbar**.

To see a list of connected devices and a current device or select another current device, left double-click on the **Connected Devices indicator** in the status bar. As a result, a dialog box with a list of connected devices will appear (Figure 41).

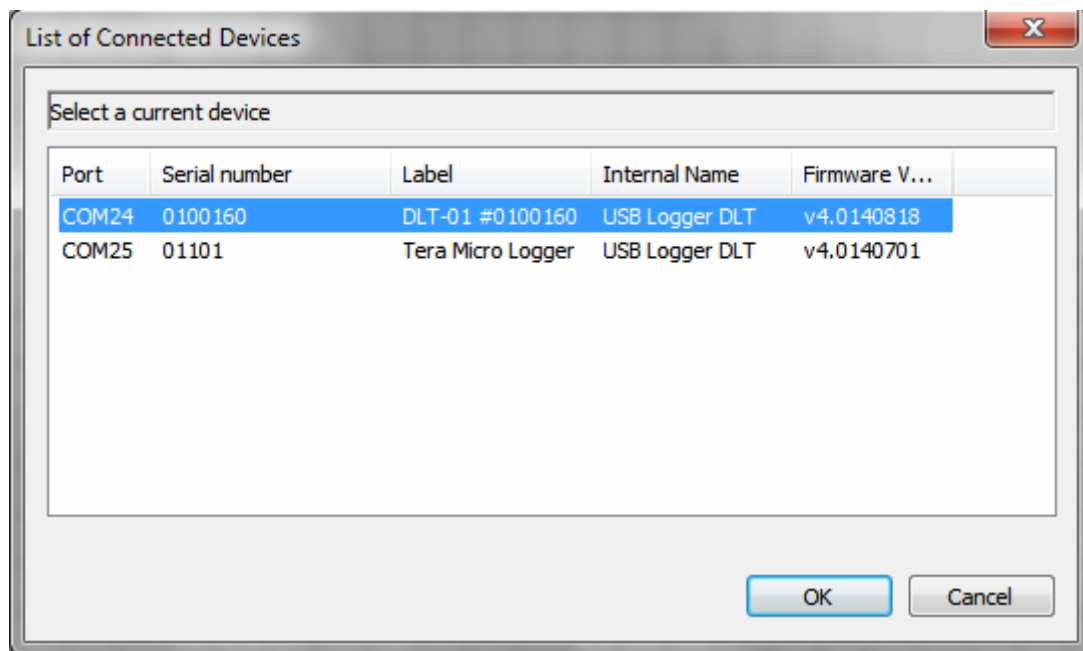


Figure 41. List of Connected Devices

The current device is highlighted in the dialog box. To change the current device, select another device in the list and click **OK**. The dialog box will close and the current device will be changed.

If the user with the rights to perform the factory setting logged in to the program, the **Factory settings** button will also be available in the dialog box.

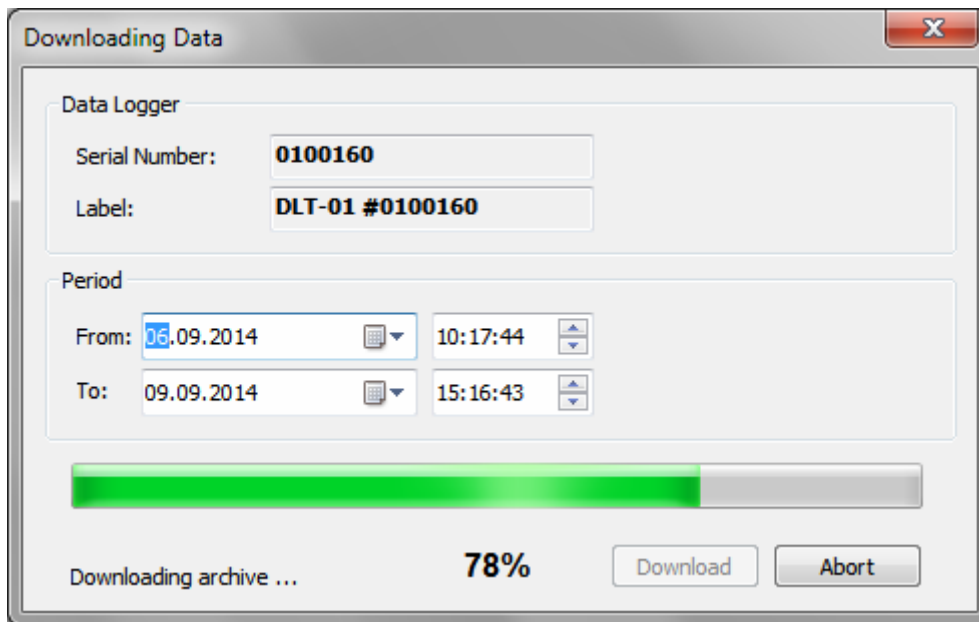
## Downloading Data from a Device

Since the command of downloading data from a device is used frequently, it is duplicated in several places:

- **Connected devices** main menu
- **Standard toolbar**
- **Loggers and Labels Panel** context menu

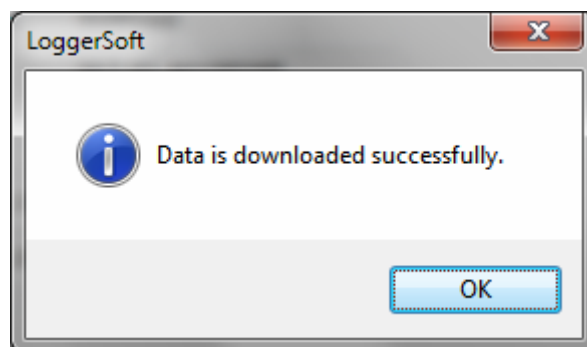
Download Data dialog box opens when selecting the command (Figure 42). The **Logger** section displays information about the data logger, which is selected for downloading, namely, its serial number and text label. The **Period** section contains the control elements for selecting the time period during which it is necessary to download the data.

To start the process of downloading, click the **Download** button. The reading process can be prematurely interrupted. To do so, click **Cancel**.



**Figure 42. Downloading Data**

Data downloading process consists of two alternate phases. First, the data is downloaded for a specified time interval, and then the data logger Event Log is downloaded. Download process is displayed in the status bar and on the process indicator. The details of operation can be found in the program Log. Downloaded data is stored in the database and from this moment available for viewing.



**Figure 43. Message about success data downloading**

After the data is read, the program will display the message shown in Figure 43. If you click **OK**, the message box and the **Downloading Data** dialog box will be closed, and the downloaded data will be displayed in the **Data Display Area** in the specified format.

If there is an error during the downloading process, the program will display the message about it. It will be possible to see more information about the error in the program Log.

## ***Viewing the Downloaded Data***

Data that once was downloaded from a data logger and stored in a database is available for viewing and analysis at any time regardless of the availability of the data logger.

To view the downloaded data, select the data logger on the **Loggers** or **Labels Panels** by left double-clicking. As a result, the **Downloaded Data Panel** will display the logger serial number and text label. Then select the downloading interval and click the **Download** button. This will start the process of downloading the data from the database. The process will be displayed in the status bar and in the program Log. At any time, the downloading process can be stopped by pressing the **Abort** button. After the download is complete, the data will be presented in the **Data Display Area** in the specified format.



The data is ready for viewing. If there is a need to change the data format, use **View main menu** or press **Standard toolbar** buttons.

## ***Printing a Graph***

To print a graph:

1. Select a data logger, the graph of which should be printed.
2. Download the data from the database for the specified time period (please refer to **Viewing the Downloaded Data**).
3. Use the **View** → **Graph** command in the main menu.
4. If preview is necessary, command **File** → **Preview** in the main menu.
5. Command **File** → **Print** in the main menu. If this command is not active, left-click on the **Data Display Area**. As a result, a standard **Print** dialog box will open. To print, select the printer and click **OK**.

## ***Printing a Table***

Printing a table process is similar to printing a graph (please refer to **Printing a Graph**).

## ***Printing the Data Logger Event Log***

Printing the data logger Event Log is similar to printing a graph (please refer to **Printing a Graph**).

## ***Printing a Report***

A report example is presented on the Figure 44.

To print a report:

1. Select a data logger, the report of which should be printed..
2. Download the data from the database for the time period that corresponds to the reporting one (please refer to **Viewing the Downloaded Data**).
3. Use the **View** → **Report** command in the main menu.
4. If necessary, change the parameters of the report (please refer to **Report**).
5. If preview is necessary, command **File** → **Preview** in the main menu.
6. Command **File** → **Print** in the main menu. If this command is not active, left-click on the **Data Display Area**. As a result, a standard **Print** dialog box will open. To print, select the printer and click **OK**.

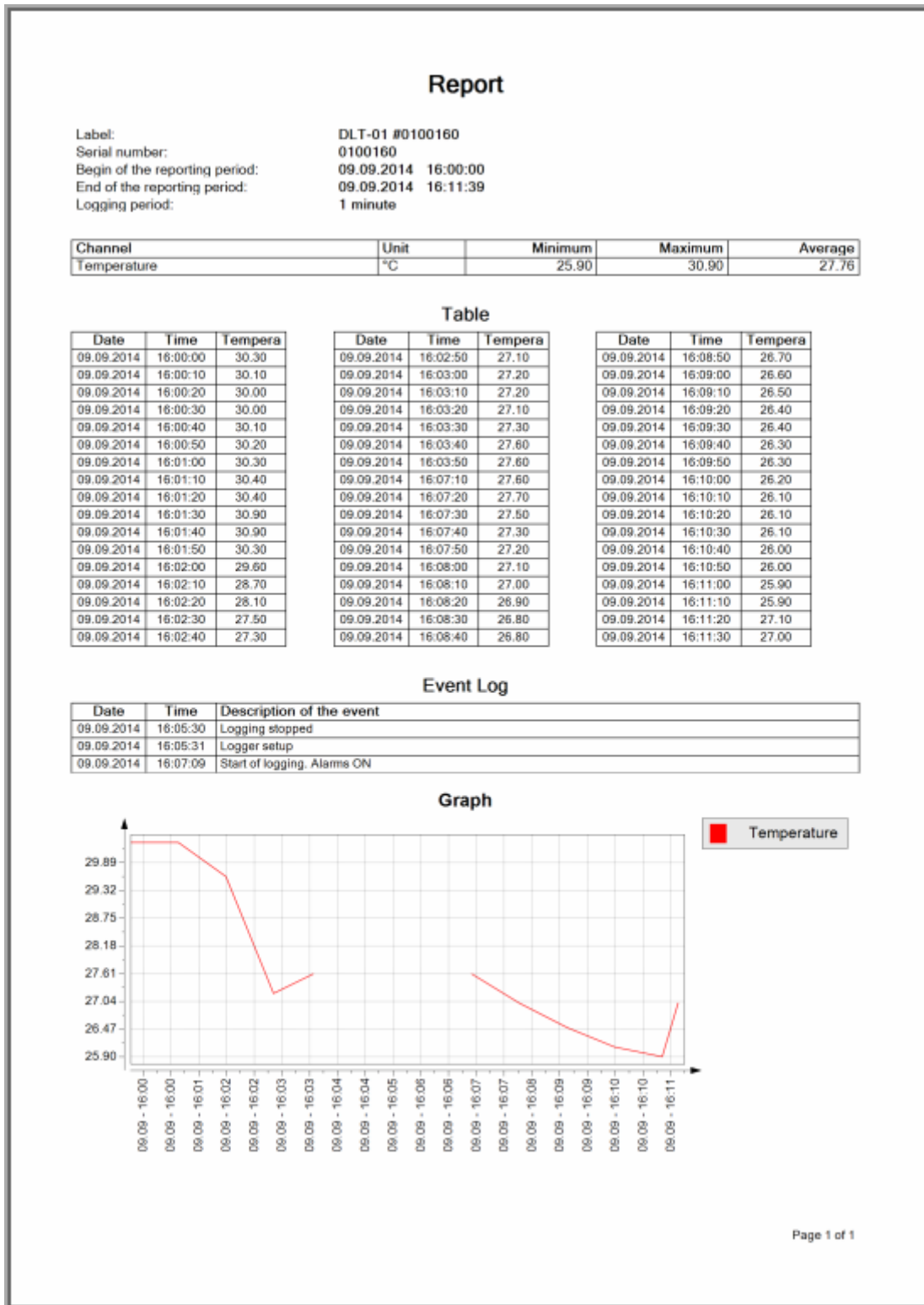


Figure 44. Report example

## User's Event Log

During the program operation, it records user's actions in the user's Event Log. The users with the appropriate rights can see the Event Log.

To open the user's Event Log (Figure 45), use the **Tools** → **User's Event Log** command in the main menu.

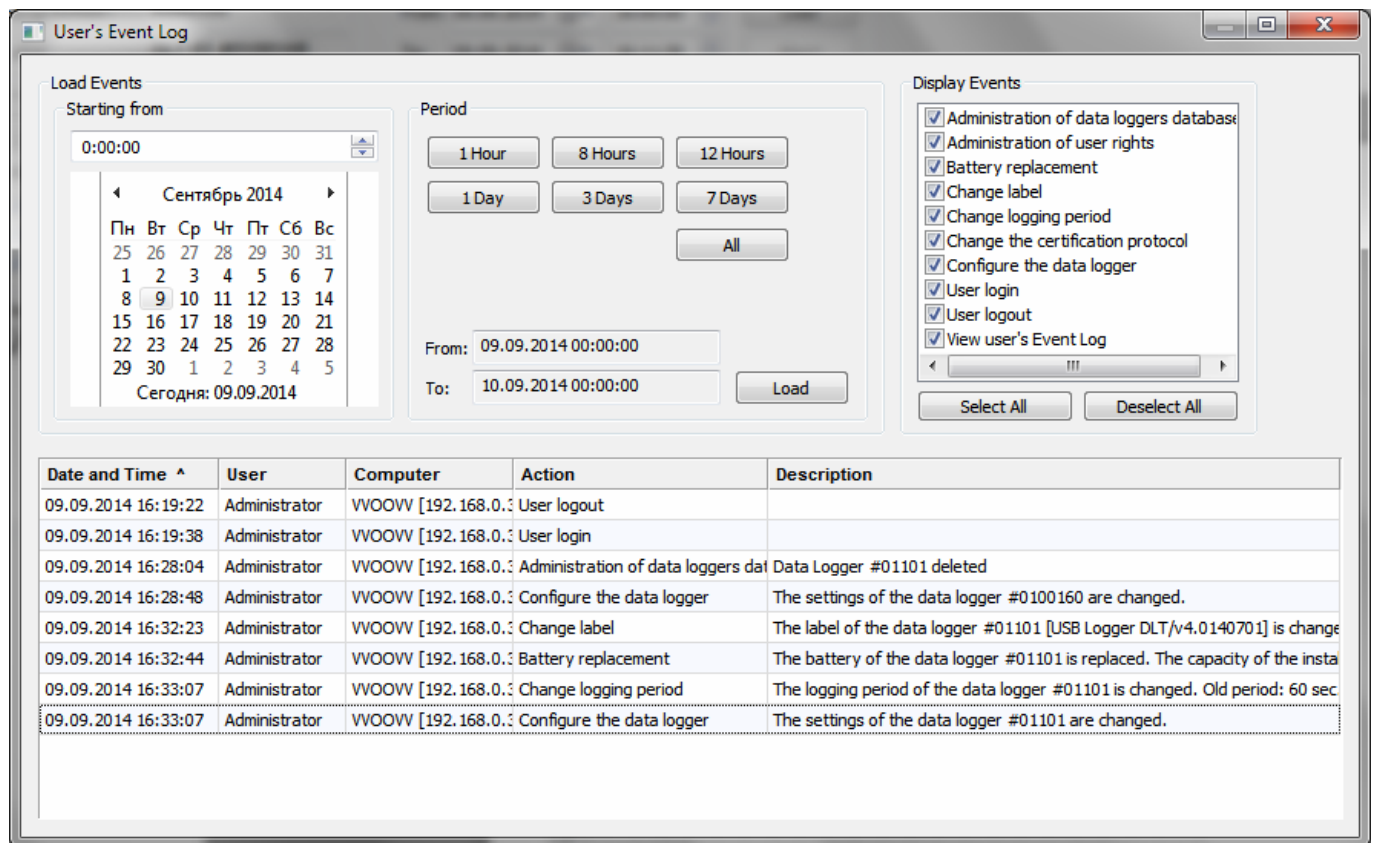


Figure 45. User's Event Log

When opening the **User's Event Log**, the list of events for the current day is automatically loaded.

To see a list of events for a different period, specify the desired length of time in the **Load Events** section and then click **Download**. The time interval is selected as follows. First, select starting date and time, then select the time duration using the **1 Hour**, **8 Hours**, **12 Hours**, **1 Day**, **3 Days**, **7 Days** buttons. To see the list of events from the selected date and time to the present, press the **All** button.

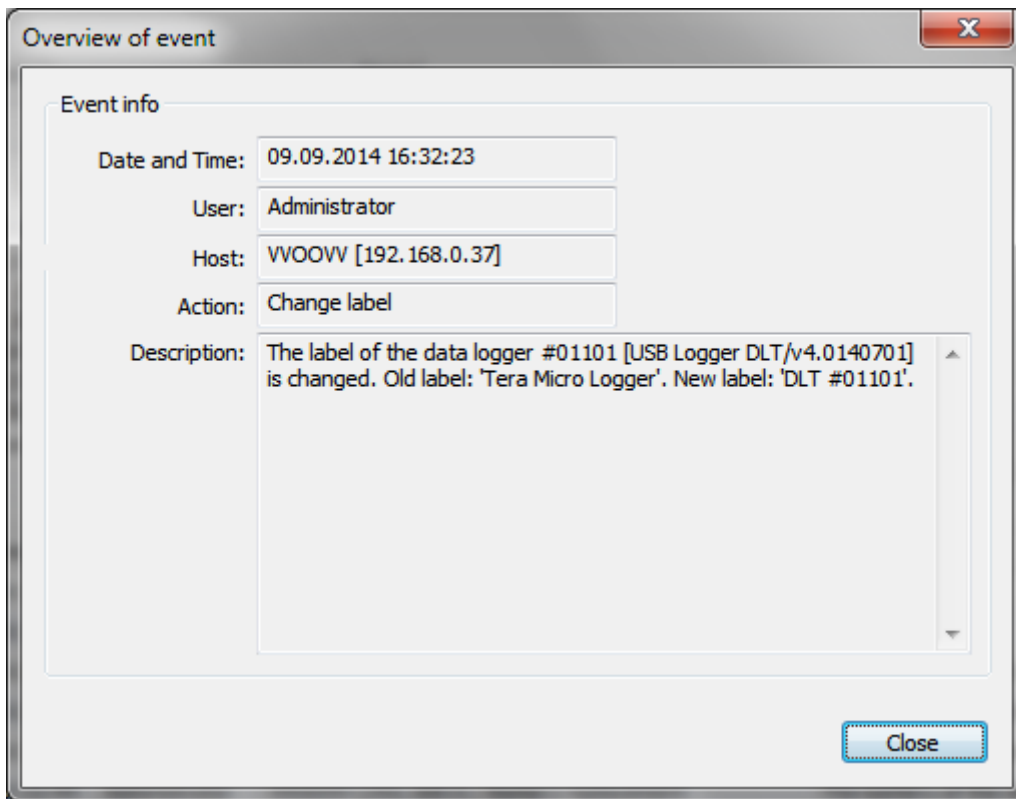
The following information is presented in the Log for each event:

- Date and time of the event
- The user who performed an action
- The computer from which the action was committed
- The type of action that has been performed
- Text description of action

There is a list of events in the **Display Events** section for filtering events. Changing the filter updates the list of events. To change the filter quickly, press the **Select All** or **Deselect All** buttons.

The list of events can be sorted by any column of the table. To sort events, left-click on the column header. Another click on the header of the same column changes the sort direction. The column by which the list is sorted at the moment and the sort direction are indicated by a special marker.

Some events may have long text descriptions. Therefore, to view detailed information about a single event left double-click on a line of interesting event. As a result, the event will be opened in a separate dialog box, an example of which is shown in Figure 46.



**Figure 46. Overview of Event**

The user Event Log can be exported to the file (please refer to **Data Export**).

## ***Data Export***

LoggerSoft supports data export in the CSV. format<sup>1</sup>. The user can export any program table: the table of historical data, the table of data logger Event Log, the table of user Event Log.

To export data, open the necessary table and right-click on it. In the context menu select **Data Export in CSV Format** and specify a file name to save.

---

<sup>1</sup> CSV (Comma-Separated Values) — text format for presenting tabular data. Each file line is one row of the table. Values of separate columns are separated by delimiters.

## LoggerSoft Settings

### Database

The database coordinates are an IP-address or the name of computer which contains the database, and the name of the database itself. The database name is preinstalled and in most cases there is no need to change it.

By default, the database coordinates indicate the local computer. If **LoggerSoft** and **Firebird** are installed on the same computer, the installation of database location is not required.

To change the database settings, use the **Settings** → **Database...** command in the main menu. As a result, the **Database Settings** dialog box will open (Figure 47). Enter the coordinates of the database in the dialog.

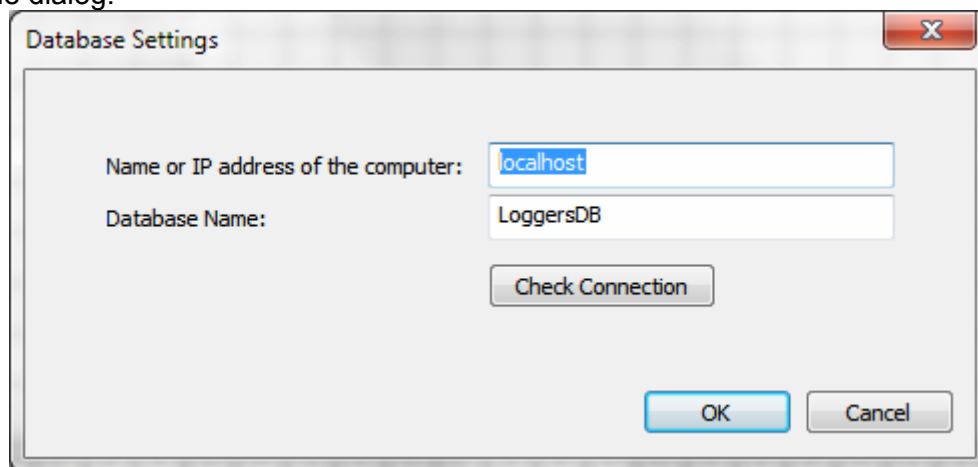


Figure 47. Database Settings

In the **Name or IP address of the computer** field enter the name or IP-address of the computer on which **Firebird** is installed. Click **Check Connection** to verify that there is a communication with the specified database. If the check connection is successful, click **OK**. The program connects to the database and the green LED lights in the status bar.

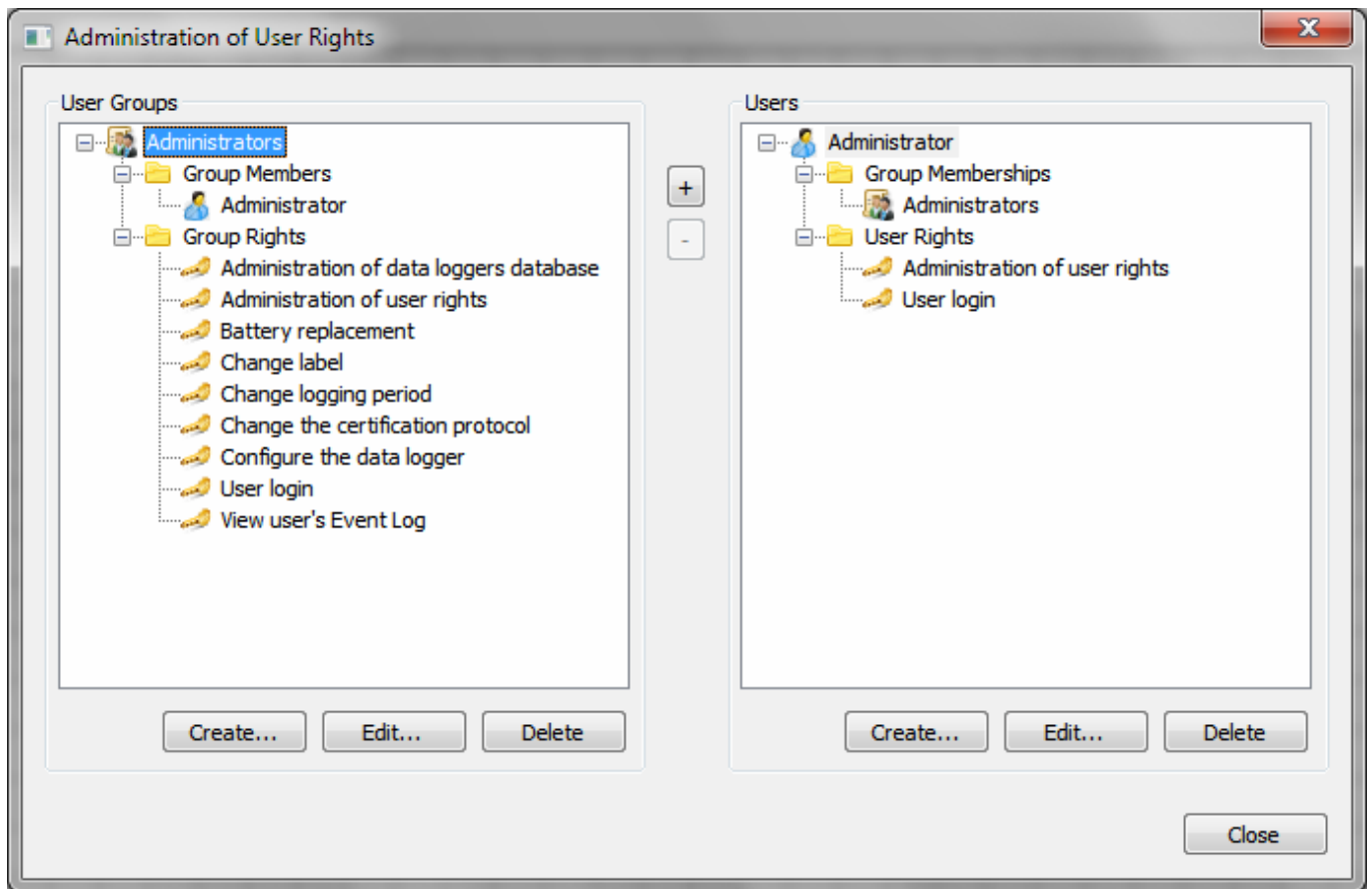
### Administration of user rights

**LoggerSoft** has a flexible system for allocating user rights. All users are divided into groups depending on the authority. Each group is assigned individual rights. The user who belongs to the group automatically receives all the rights of this group. The user may belong simultaneously to several groups, and thus he receives the rights of all groups. In addition, the user can assign additional personal rights (besides group rights).

After the database is installed, there is only one user, **Administrator**. The password for this user is not specified. This user is a part of **Administrators** group, which has full rights. Accordingly, the **Administrator** user also has full rights, too. This user is used to administer the rights of users and program settings.

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

To administer user rights, log in to the program as the **Administrator** user (or another user with the same rights) and use the **Settings** → **User Rights...** command in the main menu. As a result, the **Administration of user rights** dialog box will open (Figure 48).



**Figure 48. Administration of user rights**

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

When opening the node of **User Groups** in the tree, the user can see two child nodes: **Group Members** and **Group Rights**. **Group Members** contains all users included in this group. **Group Rights** contains a list of actions allowed for this group.

When opening the node of **Users** in the tree, the user can see two child nodes: **Group Memberships** and **User Rights**. **Group Memberships** contains a list of groups in which the user is a member. **User Rights** contains a list of actions that are permitted to the user in addition to the group rights.

Three buttons are located under each tree. Their availability depends on which node in the tree is currently selected. All three buttons are active if the group node or user node is selected respectively in the tree.

If the user presses the **Create...** or **Edit...** button under the **User Groups** tree, the **Edit a User Group** dialog box opens (see Figure 49) to create a new group or edit an existing one. If the user presses the **Delete** button, the program will ask to confirm deletion of the user group and in the case of confirmation, the group will be deleted.

If the user presses the **Create...** or **Edit...** button under the **Users** tree, the **Edit a User** dialog box opens (see Figure 50) to create a new user or edit an existing one. If the user presses the **Delete** button, the program will ask to confirm deletion of the user and in the case of confirmation, the user will be deleted.

**NOTE.** It is forbidden to delete the user who is logged in the program at the moment.

The **+** and **-** buttons between the trees are used to add users to groups and delete users from the group, respectively. The activity of these buttons depends on which nodes are highlighted in the trees at the moment.

If the user selects the **Groups** node on the left and the **Users** node on the right, the **+** button will be active. Clicking this button adds the selected user on the right to the group highlighted on the left. The program preliminary asks for confirmation.

If the user opens the **Group Members** node and selects the user in the appearing list, the **-** button will be active. Clicking this button removes the user from the group. The program preliminary asks for confirmation.

## Editing User Groups

A user group is edited by using the dialog box which is shown in Figure 49. The title of the dialog specifies what action is being performed, either creating a new group or editing an existing one.

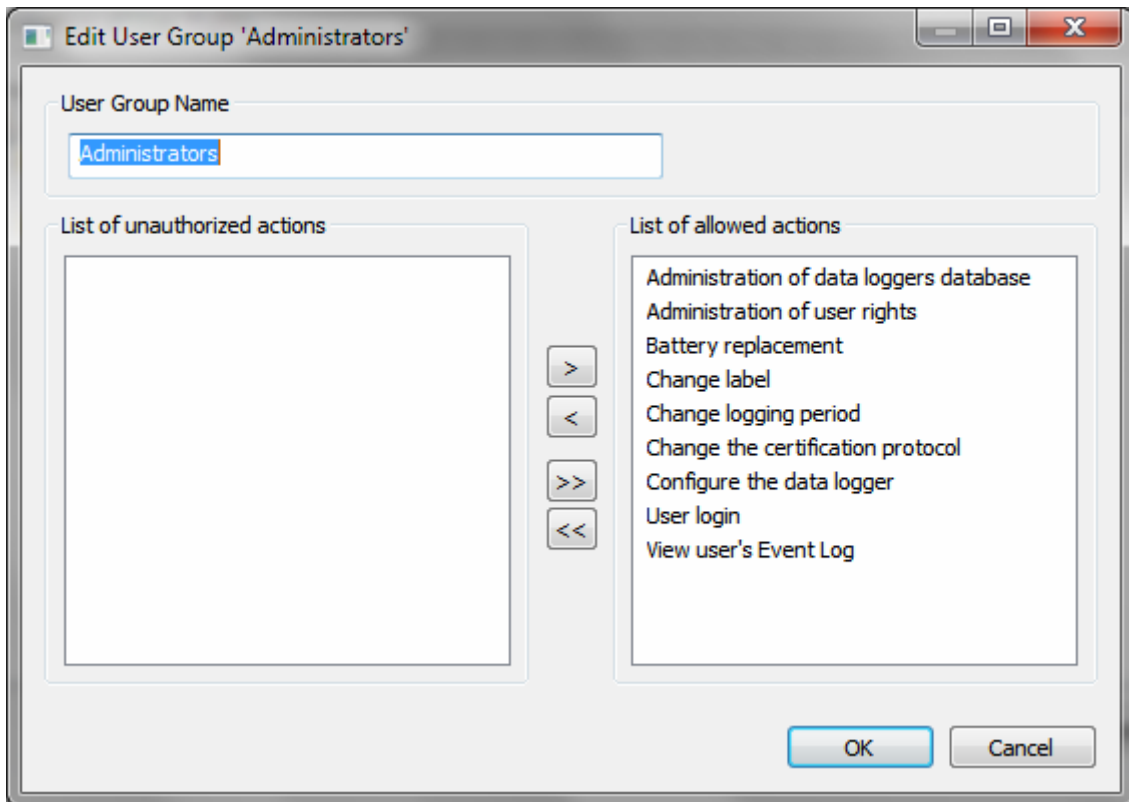


Figure 49. Editing a User Group

In the **User Group Name** section, enter the group name.

The main part of the dialog box has two lists: **List of unauthorized actions** and **List of allowed actions**. The actions that need to be allowed for group should be moved to the list of allowed actions. To move actions from one list to another, use the buttons between the lists. The > and < buttons move only those actions that are selected at the moment. The >> and << move immediately all actions. Also the user can move an action from one list to another by left double-clicking on the action list.

Click **OK** to save changes. Click **Cancel** to close the dialog box without saving changes.

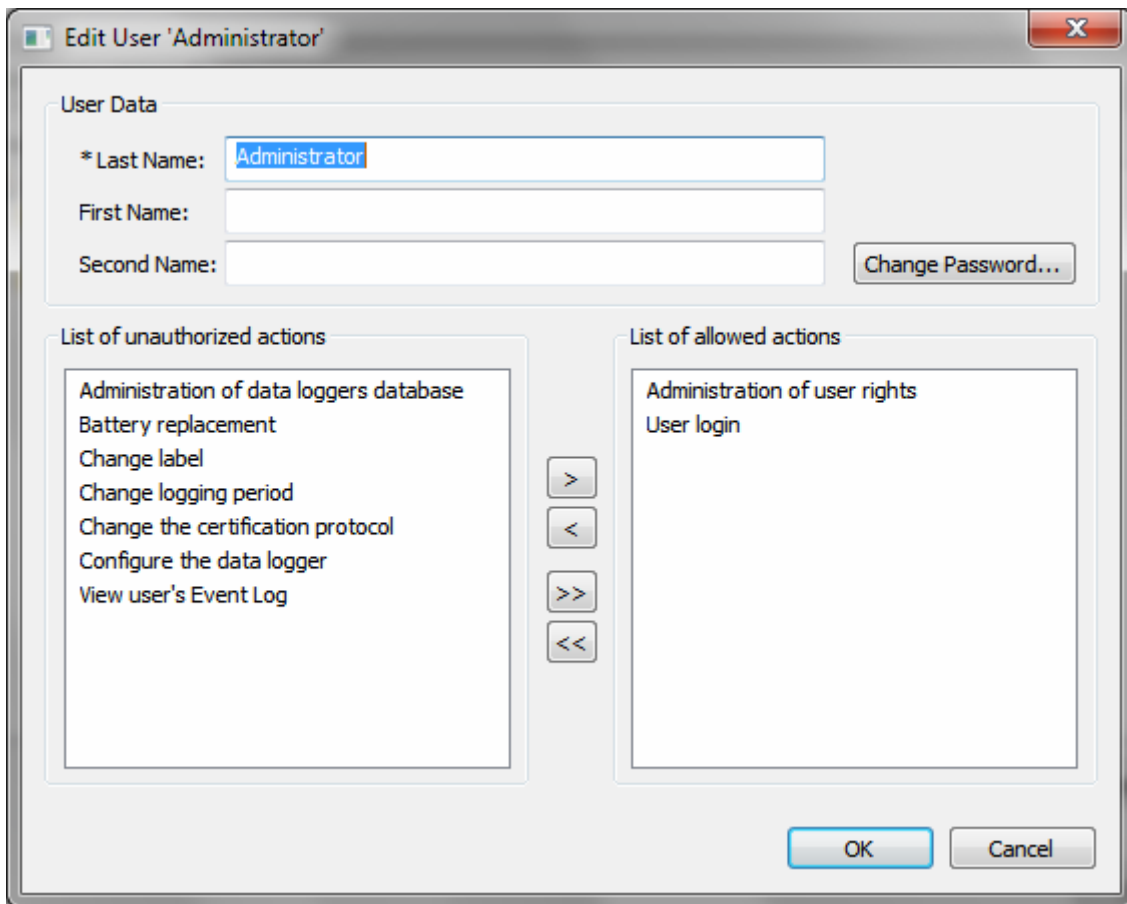
## Editing Users

Users are edited by using the dialog box, which is shown in Figure 50. The title of the dialog specifies what action is being performed: creating a new user or editing an existing one.

In the **User Data** section, enter the user's name and initials but the last name is the only required. Also there is the **Set Password...** or **Change Password...** button in this section depending on what action the dialog was opened for.

If the dialog box is opened to create a new user, set a password for a new user by clicking the **Set Password...** button. It opens the **Set Password** button (Figure 36).

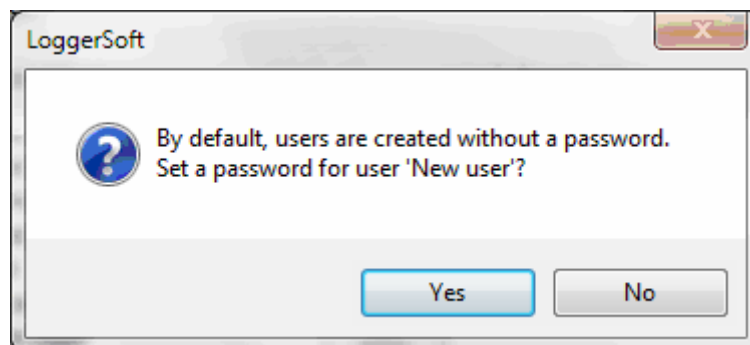
If the dialog box is opened to edit an existing user, change the user's password by clicking the **Change Password...** button. It opens **Authorization Check** button (Figure 35). For more information please refer to **Changing the User Password**.



**Figure 50. Editing a User**

The dialog box also has two lists: **List of unauthorized actions** and **List of allowed actions**. If the user needs to set personal permissions, place the appropriate actions to the list of allowed actions. The actions are transferred between the lists in the same way as for a user group (please refer to **Editing a User Group**).

Click **OK** to save changes. Click **Cancel** to close the dialog box without saving changes.



**Figure 51. Request for password setting**

If the dialog box was opened to create a new user but the password was not set, then when the changes are being saved, the program prompts to set a password (Figure 51). Click **No** to create a user without a password. Click **Yes** to set a password in the dialog box (Figure 36).



## Supported Device Types

### Overview

A device type is determined by a combination of device internal name and firmware. To work with any type of devices, the program needs a memory card and customized template of this type of device. The template can be created automatically on the base of the memory card.

When connecting the unknown types of devices to the computer, the program automatically adds this type to database. If there is a memory card, the specification of variables is created for this type of device. The specification is automatically stored in the database.

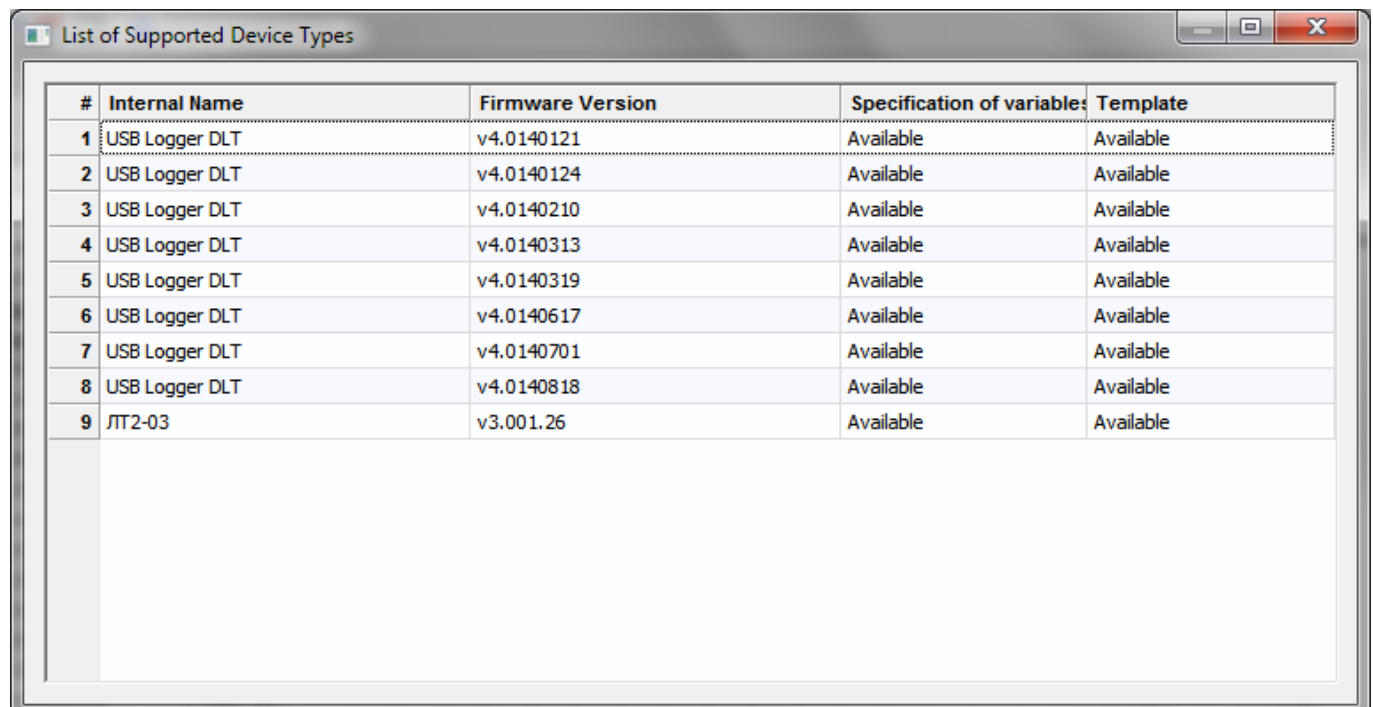
If there is no memory card, the program will not operate with devices of this type, and the message will display it. If the specification of variables is successfully created, the program automatically creates a template based on the specification. At the same time, the names of logical parameters will match the internal names of the corresponding variables. Thereafter, the program is ready to operate with devices of this type.

When connecting a device which type and template are already in the database, to the computer, software will synchronize the device with the database. It will result in creation a device exemplar with reference to the device serial number and a list of exemplar logical parameters according to the template.

The template which was created automatically is quite enough for operation, but for convenience, the user can change the names of logical parameters to more meaningful. To do this, it is possible to change the display name of the variables in the specification, the name of logical parameters in the template and the name of logical parameters of a particular device exemplar.

### List of Supported Device Types

To check if the work is supported with some type of device or configure its template, use the **Settings** → **Supported Device Types...** command in the main menu. The **List of Supported Device Types** dialog box will open (Figure 52).

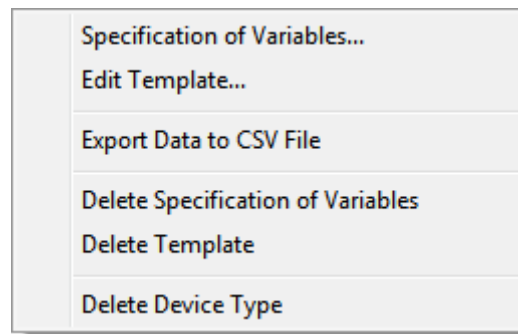


#	Internal Name	Firmware Version	Specification of variables	Template
1	USB Logger DLT	v4.0140121	Available	Available
2	USB Logger DLT	v4.0140124	Available	Available
3	USB Logger DLT	v4.0140210	Available	Available
4	USB Logger DLT	v4.0140313	Available	Available
5	USB Logger DLT	v4.0140319	Available	Available
6	USB Logger DLT	v4.0140617	Available	Available
7	USB Logger DLT	v4.0140701	Available	Available
8	USB Logger DLT	v4.0140818	Available	Available
9	ЛТ2-03	v3.001.26	Available	Available

Figure 52. List of Supported Device Types

The list of supported devices is presented in tabular format. The device's internal name, firmware version, specification of variables and template are indicated for each type of devices.

To perform any action with the type of device, right-click on the line with the interested type of device to call a context menu (Figure 53).



**Figure 53. Context menu of device type**

The **Specification of Variables...** command opens a window with a list of variables of this type of device. An example of this window is shown in Figure 54. If the database contains no specification of variables for this type of device, the program prompts the user to create a specification based on the memory card.

The **Edit Template...** command opens a window with a list of logical parameters of this type of device. An example of this 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 **Data Export in CSV Format** command allows to export the list of supported device types in the file (please refer to **Data Export**)

The **Delete Specification of Variables** command allows deleting the specification of variables of this type of devices. Before deleting, the program asks for confirmation.

**NOTE.** The specification is deleted simultaneously with the template. So if there is a template in the database, the program requests additional confirmation to delete the template.

The **Delete Template** command deletes a template of this type of device. Before deleting the program asks for confirmation.

The **Delete Device Type** command allows deleting a type of devices from the database together with the specification of variables and template. Before deleting, the program asks for confirmation.

**WARNING!** If the database contains devices of the type that you are deleting, then all exemplars of this type of device will be deleted with the type of device. In this case, the program gives an additional warning. However, be very careful when deleting a device type.

## Specification of Variables

Specification of variables is created based on the device type memory card. The memory card is a text file of special format. Memory cards are located in **Devmaps** folder, which in turn is located in the folder where the program was installed. By default, this folder is **C: \Program Files\TERA\LoggerSoft**.

Specification of variables is presented in tabular format (Figure 54). Each row corresponds to one variable from the memory card. The table contains the **Display Name**, **Internal Name**, **Data Type**, **Dimension**, and **Permissions** columns which can be edited.

The **Display Name** column is the text that will be used as the name of logical parameters when creating a template. To change the display name of the variable, left double-click on the interested cell. The cell will display the input field. Make changes and press **Enter** to save changes to the database, or press **Esc** to undo the changes.

The **Internal Name** column indicates the original name of the variable in the memory card.

The **Data Type** column indicates the data type of the variable.

The **Dimension** column contains the variable dimension.

The **Permissions** column contains permissions for the specified variable.

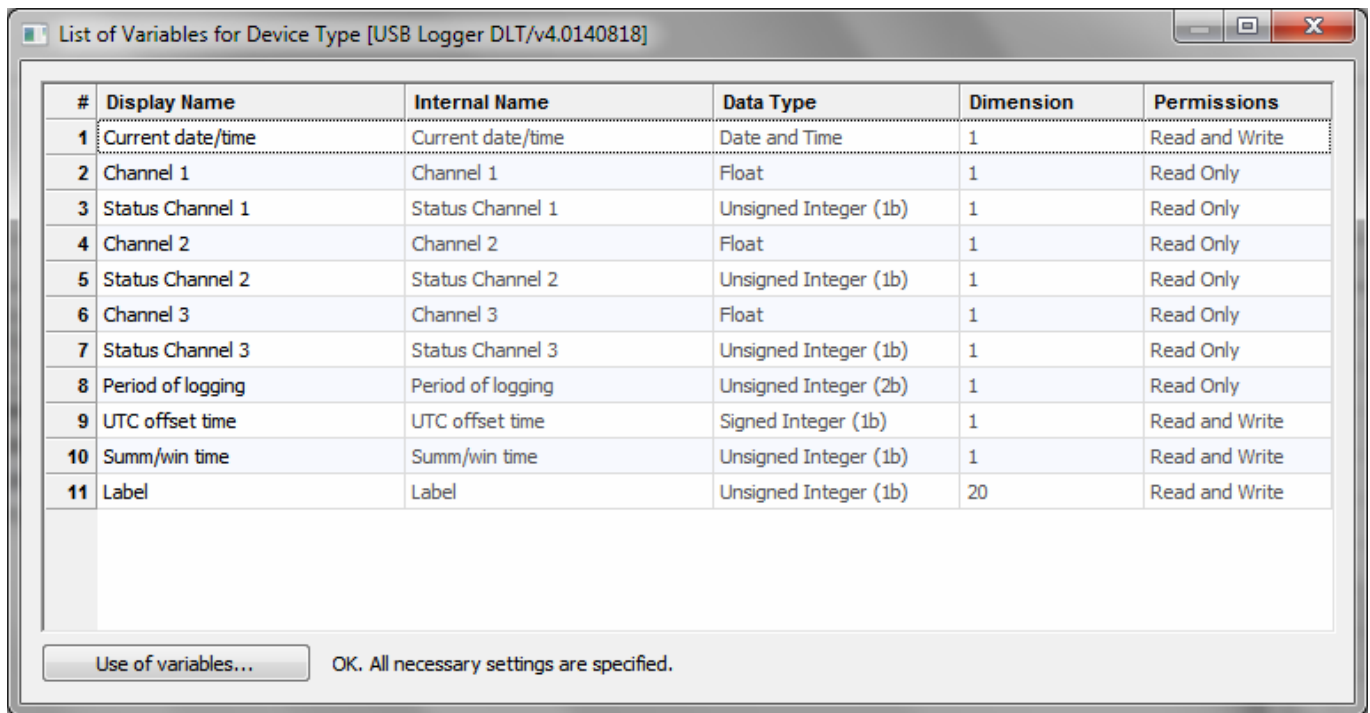


Figure 54. List of variables for device type

Each device type must correspond to a number of key variables that are used by the program to synchronize time and reading/writing of a text label. For this purpose there is the **Use of variables...** button at the bottom of the dialog box. The inscription about the current state of the settings is located near the button. If all the key variables are set, the inscription is as follows: **OK. All necessary settings are specified.** If the key variables are not set, the inscription will be the following: **WARNING! You must specify the assignment of variables!**

Click this button to open the **Settings for devices** dialog box (see Figure 55).

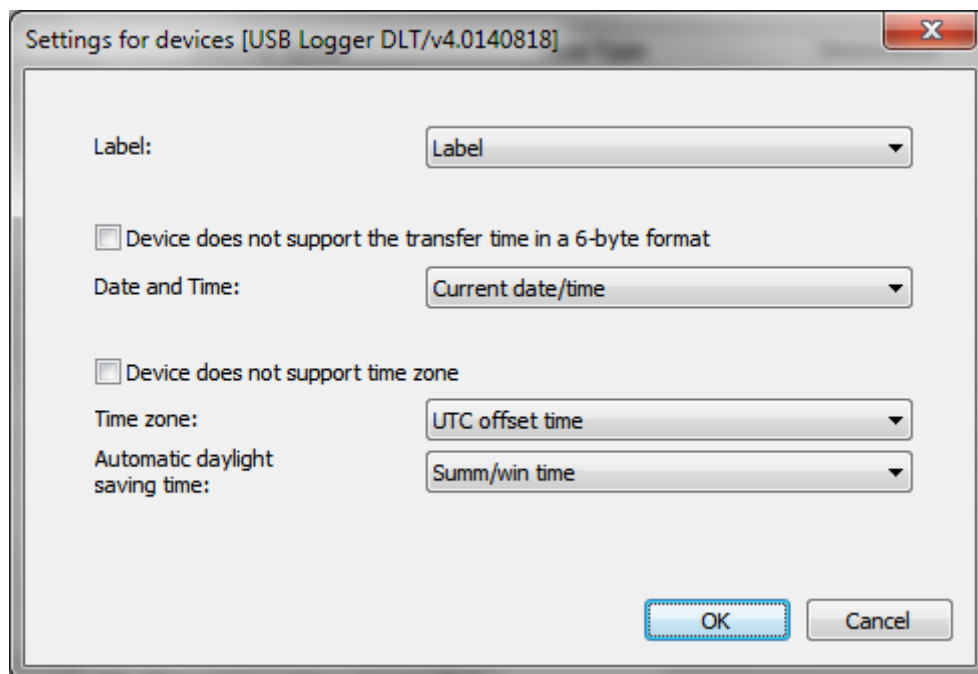


Figure 55. Settings for devices

In this dialog specify a variable for a text label, date and time, time zone, as well as a variable that is responsible for setting the automatic transition to summer time. If the device does not support setting of time zone, check the **Device does not support time zone** checkbox. If the device does not support the time in the 6-byte format, check the **Device does not support the transfer time in a 6-byte format** checkbox.

For selection of variable use the dialog drop-down lists which contain all the variables of this type of device.

The **OK** button closes the dialog box and saves your changes. The **Cancel** button closes the dialog box without saving changes.

### Template

The template is also represented as a table (Figure 56). Each row represents the logical parameter of this type of devices. The first three columns can be edited. They are **Display Name**, **Units** and **Logged**. The last four columns are read only. These columns contain information about the variable, on the base of which the parameter was created. They are: **Variable Name**, **Index**, **Data Type** and **Permissions**.

#	Display Name	Units	Logged	Variable Name	Array Index	Data Type	Permissions
1	Current date/time	Measure Unit Not Set, --	No	Current date/time	0	Date and Time	Read and Write
2	Channel 1	Temperature, °C	Yes	Channel 1	0	Float	Read Only
3	Status Channel 1	Measure Unit Not Set, --	No	Status Channel 1	0	Unsigned Integer (1b)	Read Only
4	Channel 2	Humidity, %	Yes	Channel 2	0	Float	Read Only
5	Status Channel 2	Measure Unit Not Set, --	No	Status Channel 2	0	Unsigned Integer (1b)	Read Only
6	Channel 3	Measure Unit Not Set, --	No	Channel 3	0	Float	Read Only
7	Status Channel 3	Measure Unit Not Set, --	No	Status Channel 3	0	Unsigned Integer (1b)	Read Only
8	Period of logging	Measure Unit Not Set, --	No	Period of logging	0	Unsigned Integer (2b)	Read Only
9	UTC offset time	Measure Unit Not Set, --	No	UTC offset time	0	Signed Integer (1b)	Read and Write
10	Summ/win time	Measure Unit Not Set, --	No	Summ/win time	0	Unsigned Integer (1b)	Read and Write

Figure 56. Template of device type

The **Display Name** column is the text that will be used as the name of the logical parameter when creating an exemplar of the device template. To make changes to this column, left double-click on the interested cell. The cell will display the input field. Make changes and press **Enter** to save changes to the database, or press **Esc** to undo the changes.

In the **Units** column specify the units for the parameters that are recorded by the device. This information is used by the program when displaying the recorded data. Each cell in this column has a drop-down list of all known program units (please refer to **Units**).

The **Recorded** column indicates if a parameter is recorded or not. For this purpose, a dropdown list is built in the cells of the column. This information is used by the program when displaying the recorded data. When the template is created and the device is connected, this feature is automatically installed, but there may be situations in which it should be done manually.

**NOTE.** Remember when each new device is connected, the list of logical parameters is created according to the template of this type of devices. Therefore, it is important that the template has been fully configured and contained no errors.

### List of device logical parameters

Each data logger in the database has a list of logical parameters that were created according the template during the first synchronization with the database of the current data logger. After the logical parameters were created, they can be changed. In most cases, it is not required, but still there are times when it must be done.

To change the settings of logical parameters, use the **List of Logical Parameters** command in the context menu of data logger (please refer to **Data Logger Context Menu**). As a result, the dialog box with the logical parameters of data logger will appear (Figure 57).

#	Display Name	Units	Logged	Variable Name	Array In	Data Type	Permissions
1	Current date/time	Measure Unit Not Set, --	No	Current date/time	0	Date and Time	Read and Write
2	Channel 1	Temperature, °C	Yes	Channel 1	0	Float	Read Only
3	Status Channel 1	Measure Unit Not Set, --	No	Status Channel 1	0	Unsigned Integer (1b)	Read Only
4	Channel 2	Humidity, %	No	Channel 2	0	Float	Read Only
5	Status Channel 2	Measure Unit Not Set, --	No	Status Channel 2	0	Unsigned Integer (1b)	Read Only
6	Channel 3	Temperature, °C	No	Channel 3	0	Float	Read Only
7	Status Channel 3	Measure Unit Not Set, --	No	Status Channel 3	0	Unsigned Integer (1b)	Read Only
8	Period of logging	Measure Unit Not Set, --	No	Period of logging	0	Unsigned Integer (2b)	Read Only
9	UTC offset time	Measure Unit Not Set, --	No	UTC offset time	0	Signed Integer (1b)	Read and Write
10	Summ/win time	Measure Unit Not Set, --	No	Summ/win time	0	Unsigned Integer (1b)	Read and Write

Figure 57. Data Logger Logical Parameters

The window with a list of logical parameters of a particular data logger is very similar to the window with the template logical parameters (please refer to **Template**). It displays the same information, and parameters are edited in the same way. But the difference is that this window displays the logical parameters of the particular device, rather than the logical parameters of the template for a device type.

## Logger Configuration

### Data Logger Series

The LoggerSoft software supports LT and DLT series data loggers.

Since data loggers of different series have different settings, and the program uses various dialogs to set them up. In addition, some of the functions that are available in the DLT series data loggers are not available to LT series data loggers.

### Time Synchronization

Data logger time can be synchronized with computer time both on-demand programs while searching a data logger (please refer to **Search for Connected Devices**) and at any time by clicking **Time Synchronization** in the **Connected Devices** main menu or data logger context menu (please refer to **Connected Devices Menu** and **Data Logger Context Menu**). Time can be also synchronized by pressing the button on the configuration dialog of the data logger.

The process of time synchronization is displayed in the window of the program Log and in the status bar.

### Changing a Text Label

A data logger text label serves to illustrate the functional purpose of the data logger at the moment. This is an electronic equivalent of a label or a tag. Since the logger functionality may change over time, and then the text label can also be changed.

A text label is changed in the **Changing Label** dialog box (Figure 58). To open this dialog box, press the corresponding button on the dialog box of the data logger settings (please refer to **Logging Page** of the corresponding data logger series).

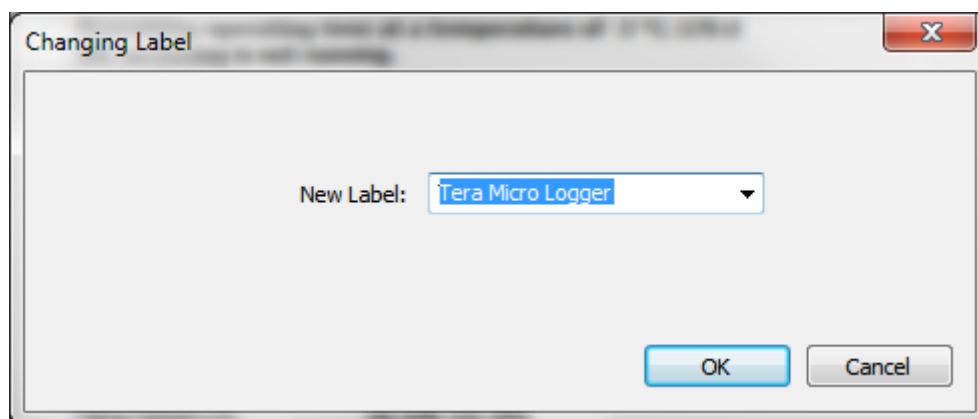


Figure 58. Changing Label

New label can be entered from the keyboard or selected from the list. The drop-down list shows all text labels, which are in the database at the moment.

To change the label of the data logger, click **OK**. As a result, the dialog box will close and a new label will be recorded to the data logger. The program will inform the results of recording with a message. Details of the operation can be found in the program Log.

Click **Cancel** to close the dialog box without recording the text label to the data logger.

## Changing the Metrological Certificate

**NOTE.** Function of data storage about metrological certificate is only available for DLT series data loggers.

DLT series data loggers store information about metrological certificate in their non-volatile memory. Metrological certificate is specified in the LoggerSoft program. The information includes the certificate number and its expiration date.

Information about the data logger metrological certificate is entered in the **Data Logger's Metrological Certificate** dialog box (Figure 59). To open this dialog box, press the corresponding button on the dialog box of the data logger settings (please refer to **Logging Tab**).

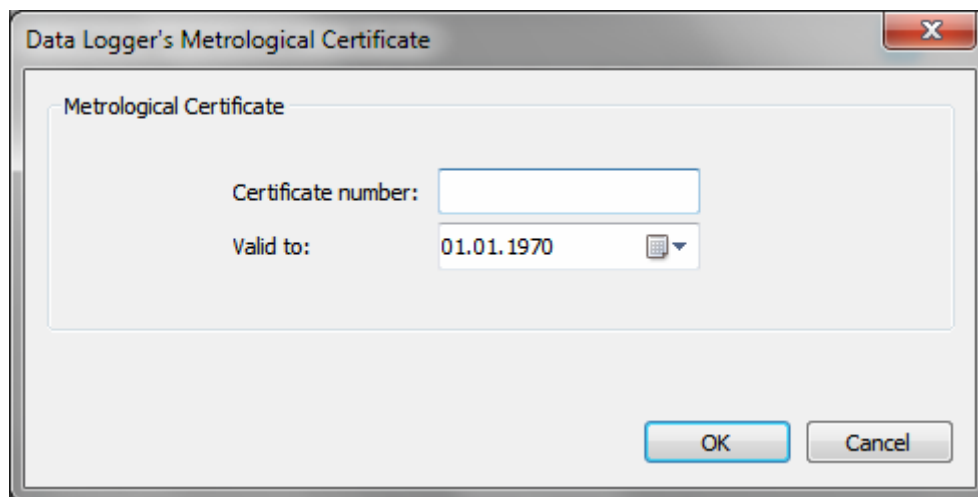


Figure 59. Data Logger's Metrological Certificate

In the **Certificate Number** field specify the number of existing metrological certificate of the data logger.

In the **Valid to** field specify the date of the next verification of the data logger.

Click **OK** to record this information to the logger. The dialog box will be closed. The program will inform about the results of recording with a message. Details of the operation can be found in the program Log.

Click **Cancel** to close the dialog box without recording information to the data logger.

## Changing the Logging Period

Logging period is the time interval after which the logger saves the sensor readings in the internal nonvolatile memory.

Logging period is changed during the logger set up (please refer to **Data Logger Configuration**). A new period is chosen in the **Set Logging Period** dialog box, an example of which is shown in Figure 60. To open this dialog, press the corresponding button on the dialog box of the data logger settings.



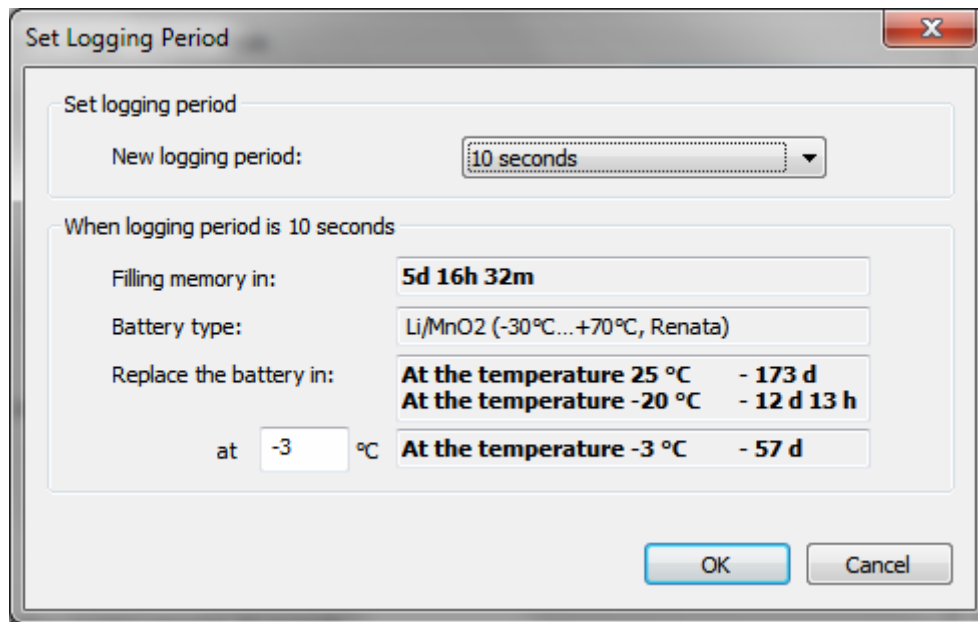


Figure 60. Set Logging Period

The **New logging period** field contains important information about the data logger, which depends on the selected logging period.

The **Filling memory in** field displays the estimated time of data logger complete memory at a specified logging period.

The **Battery type** field indicates the type of battery that uses the data logger. If the battery type is unknown, this field will display the text: **0. This type is not supported.**

The **Replace the battery in** field displays the predicted operating time period of data logger at the specified logging period. The predicted operating time is specified for the three ambient temperatures. Two of them are fixed at values of 25 ° C and -20 ° C. And another temperature can be set in the appropriate field.

**WARNING!** Data logger operation depends on the ambient temperature, since at low temperatures the battery capacity reduces. Therefore, during the data logger configuration note the predicted time to replace the battery. Specify the temperature at which it is intended to use the data logger. If the data logger is supposed to be used in a certain temperature range, it is necessary to specify the lowest temperature in this range. If the predicted operating time at the temperature at which the data logger is supposed to be used, is comparable or less than the time at which the data logger is supposed to be used, the data logger cannot be used. Should either increase the logging period, or replace the battery.

**NOTE.** The function of predicted operating time is only available for the DLT series data loggers. To save changes, click **OK**. To close the dialog box without saving changes, click **Cancel**.

## Setting Up the LT Series Data Loggers

To configure the data logger, use the **Connected Devices -> Setup...** command in the main menu or in the data logger context menu (please refer to **Connected Devices Menu** and **Data Logger Context Menu**). The **Settings of Data Logger** dialog box will appear (Figure 61).

The title of the dialog box contains the serial number of the data logger which is to be configured.

The dialog box contains 5 tabs. Two of them have fixed names. They are **Logging** and **Delayed Start**. Other three tabs correspond to the measuring channels of the data logger and their names correspond to the names of logical parameters, which in turn correspond to the particular measuring channel of the data logger (please refer to **List of device logical parameters**).

If the login is made on behalf of the user who has the rights to perform the factory settings, the **Factory Settings** tab will be also available in the dialog box.

Clicking on the **Read** button will read the current settings from the data logger.



The **Apply** button is used to record new settings to the data logger.

The **Close** button closes the dialog box.

## Logging Tab

The **Logging** tab contains settings that relate to the logging process (Figure 61).

The **Logger time** field displays the current logger time. The **Synchronize** button is located next to it. If there is a need, press the button to synchronize data logger time with the computer time.

The **Label** field shows the current text label of this data logger. To change it, click the **Change...** button next to the field. As a result, the **Change Label** dialog box will appear. The example of the dialog is shown in Figure 58 (please refer to **Changing a Text Label**).

The **Logging period** field indicates the current logging period of the data logger. To change the logging period, click the **Change...** button next to the field. As a result, the **Set Logging Period** dialog box will open. The example of the dialog is shown in Figure 60 (please refer to **Changing the Logging Period**).

The **Filling memory in** field displays the estimated time of data logger complete memory at a specified logging period.

**WARNING!** If the complete memory time is comparable to or less than the time during which the logger is supposed to be used, increase the logging period.

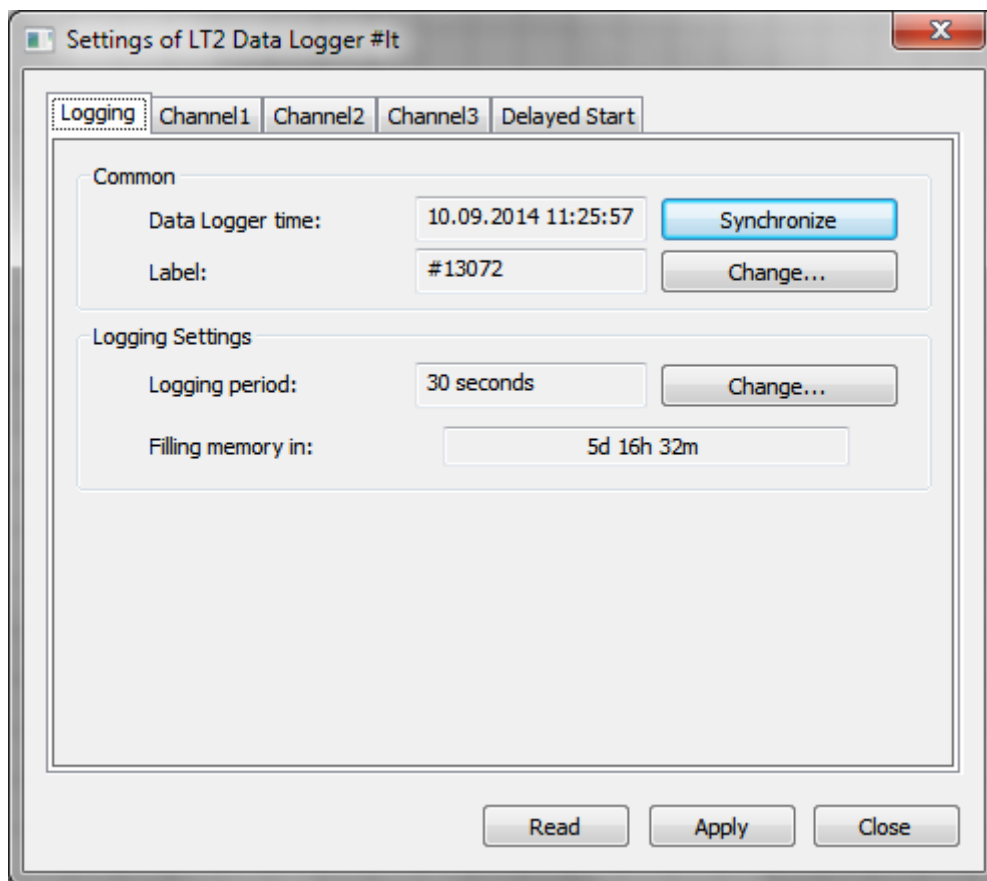
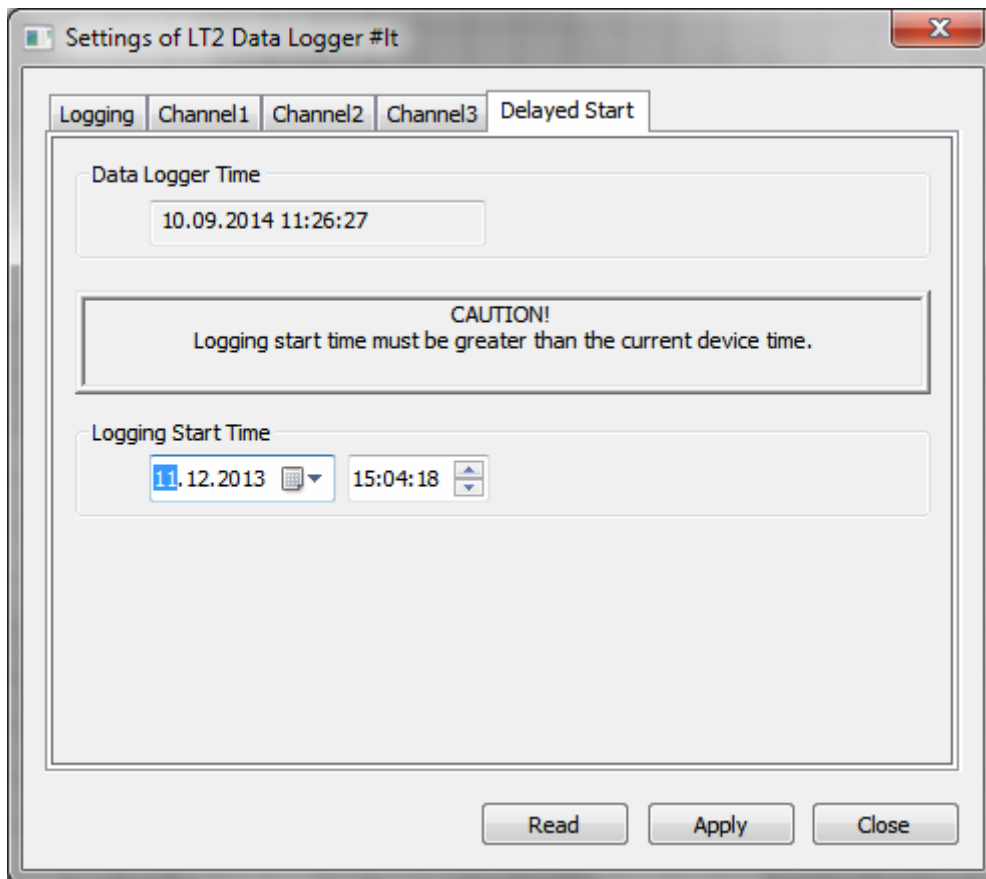


Figure 61. Settings of LT2 Data Logger. Logging tab

## Delayed Start Tab

The **Delayed Start** tab contains the settings of the delayed start of a data logger (Figure 62).



**Figure 62. Settings of LT2 Data Logger. Delayed Start Tab**

The **Data Logger Time** section shows the current time of a data logger. If there is a need to synchronize the data logger time with the computer time, click the **Logging** tab and synchronize the time.

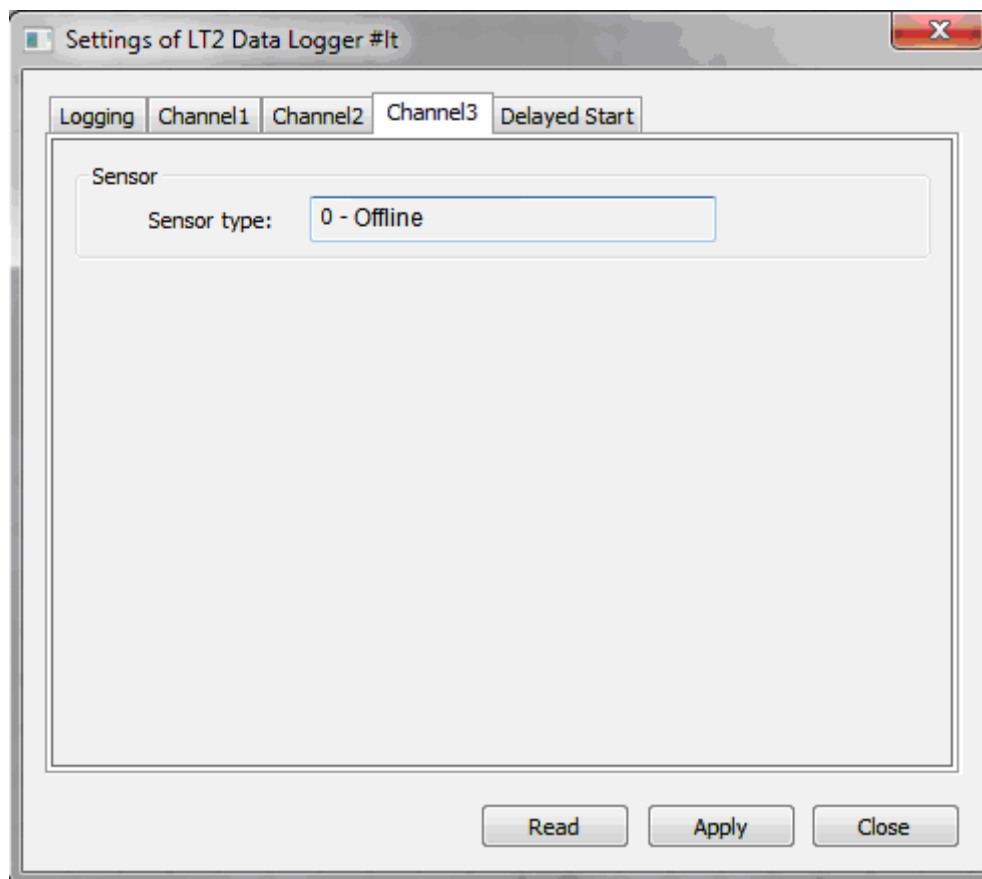
In the **Logging Start Time** section specify the delayed start time.

**NOTE.** To activate the delayed start, specify the logging start time greater than the current device time.

## Measuring Channel Tabs

The **Measuring Channel** tabs are identical for all data logger channels, but their contents can vary depending on the data logger factory settings. The tab titles correspond with the titles of logical parameters, which in turn correspond to a particular measuring channel of the data logger (please refer to **List of device logical parameters**).

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



**Figure 63. Settings of LT2 Data Logger. Measuring channel is disabled**

If RTD temperature sensor is set to the measuring channel, the tab will take the form an example of which is shown in Figure 64.

The **Sensor** section specifies the type of sensor that is configured for this channel.

The **Limits of acceptable values** section sets upper and lower limits of acceptable values. When the sensor readings are out of the specified range, the data logger will record it to the Event Log.

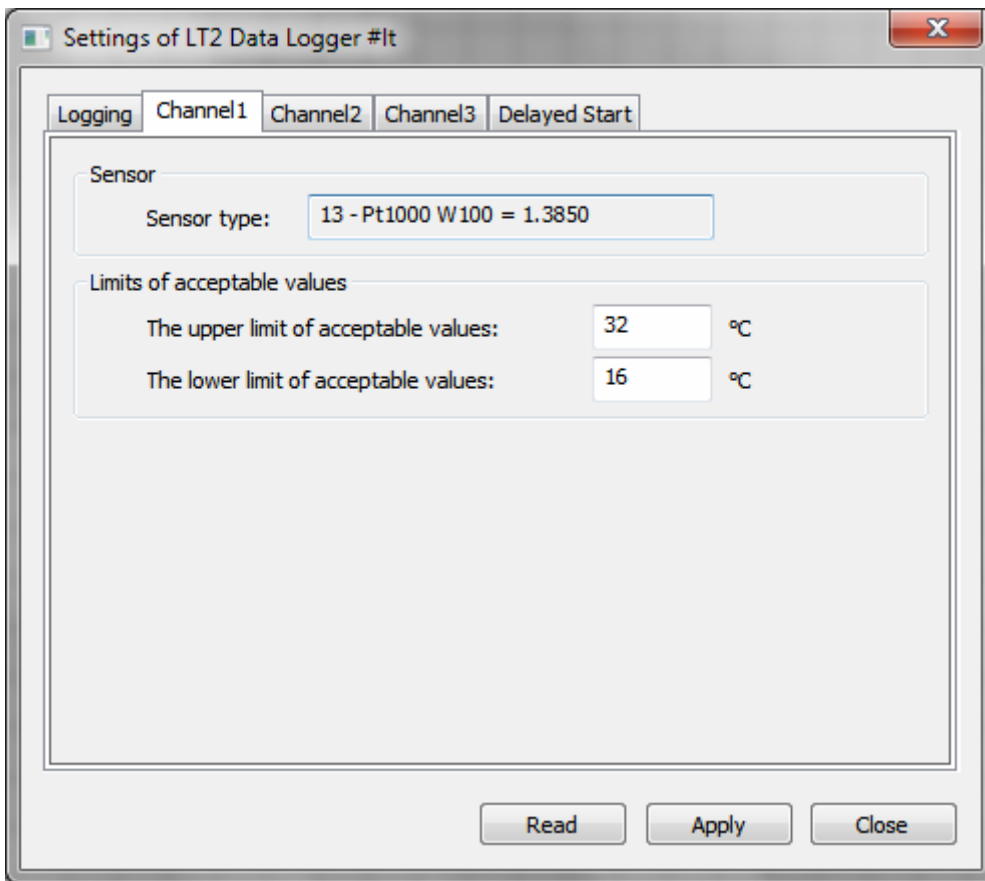


Figure 64. Settings of LT2 Data Logger. RTD Type

If the sensor type of the current input is 4-20 mA current, the page will take the form an example of which is shown in Figure 65.

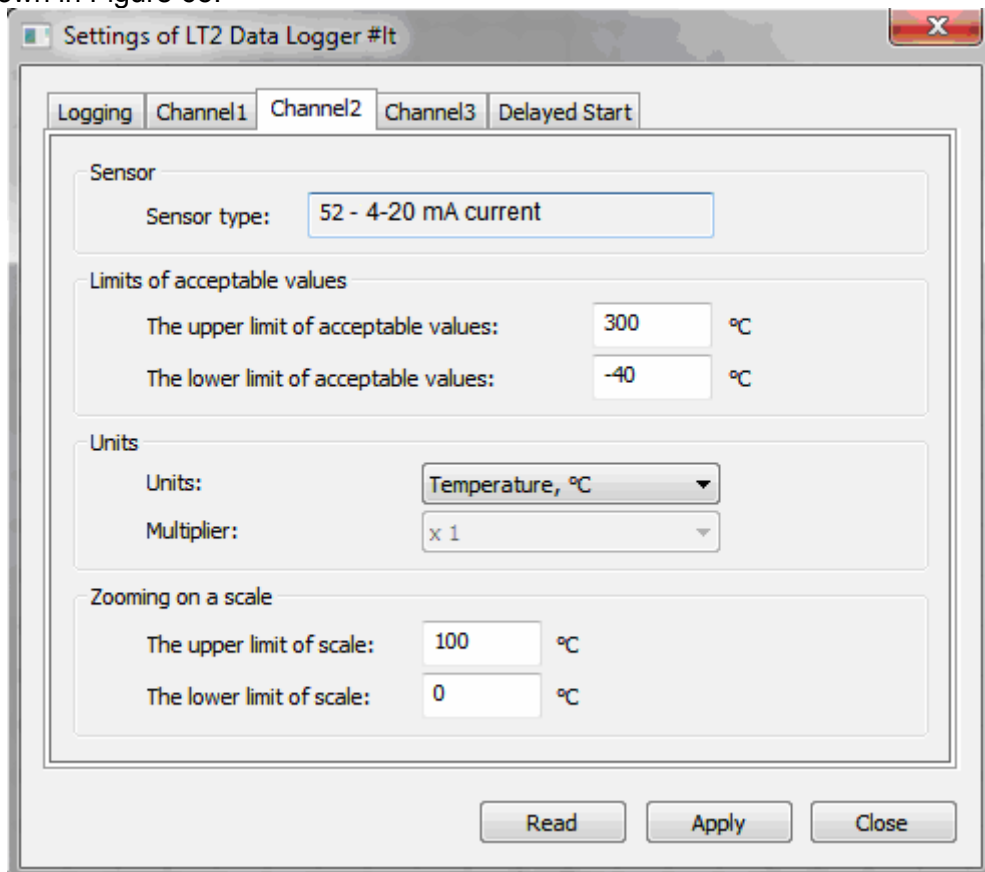


Figure 65. Settings of LT2 Data Logger. Current input.

The **Sensor** and **Limits of acceptable values** sections set the same settings as for RTD types.

The **Units** section contains a drop-down list with the measuring units and a drop-down list of multipliers values. List of multipliers is not available when temperature or humidity is selected as the unit of measurement.

The **Zooming on a scale** section specifies upper and lower limits of the scale of measurement. Scaling is done as follows. For example, the limits of the scales are set as in Figure 65, from 0 to 100°C. As a result, for the 4-20 mA current input the sensor reading equal to 4 mA will be converted to 0°C and 20 mA reading will be converted to 100°C.

## Setting Up DLT Series Data Loggers

To configure a data logger, use the **Connected Devices ->Setup...** command in the main menu or in the context menu of the data logger (please refer to **Connected Devices Menu** and **Data Logger Context Menu**). The **Data Logger Settings** dialog box will appear (Figure 66).

The title of the dialog box contains the serial number of the data logger which is to be configured.

The dialog box contains several tabs. Four of them have fixed names. They are **Logging**, **Start**, **Buttons** and **Report**. Additionally, one tab is created for each measuring channel. In Figure 66 these are **Temperature** and **Humidity** tabs. As already mentioned, the number of additional tabs depends on the number of the data logger measuring channels. Names of additional tabs correspond to the names of logical parameters, which in turn correspond to the particular measuring channel of the data logger (please refer to **List of device logical parameters**).

The **Restore Default Settings** button allows resetting the current settings and restoring the factory. Before performing this operation, the program asks for confirmation.

Pressing **Read Settings From the Logger** button reads the current settings from the data logger.

The **Load From File** button saves data logger settings previously saved to the file.

The **Save To File** button saves current data logger settings to the file.

The **Stop Logging** button stops the data logging and translates a data logger into a low power mode. This button is disabled if there is no logging process.

The **Apply** button is used to write new settings to the data logger.

The **Close** button closes the dialog box.

### Logging Tab

**Logging** tab displays the current logger status, and also contains settings that relate to the logging process (Figure 66).

The **Data Logger Current State** section contains information about the current state of the data logger. This information includes the data logger time, text label, battery capacity, data about metrological certificate, logging status and remaining operating time to discharge the battery at a given operating temperature.

The **Logger Time** field displays the current logger time. The **Synchronize** button is located next to it. If there is a need, press the button to synchronize data logger time with the computer time.

The **Label** field shows the current text label of this data logger. To change it, click the **Change...** button next to the field. As a result, the **Change Label** dialog box will appear. The example of the dialog is shown in Figure 58 (please refer to **Changing a Text Label**).

The **Battery Capacity, mAh** field contains the remaining battery capacity at 25°C.

The **Metrological Certificate** field shows the number and duration of the metrological certificate for this data logger. To change information about the certificate, press the ... button. The **Data Logger's Metrological Certificate** dialog box will appear. The example of the dialog is shown in Figure 59 (please refer to **Changing the Metrological Certificate**).

There is a field of the data logger current status under the metrological certificate field. This field displays in bold remaining operating time of battery life at a given operating temperature, as well as the current operating mode of the data logger.

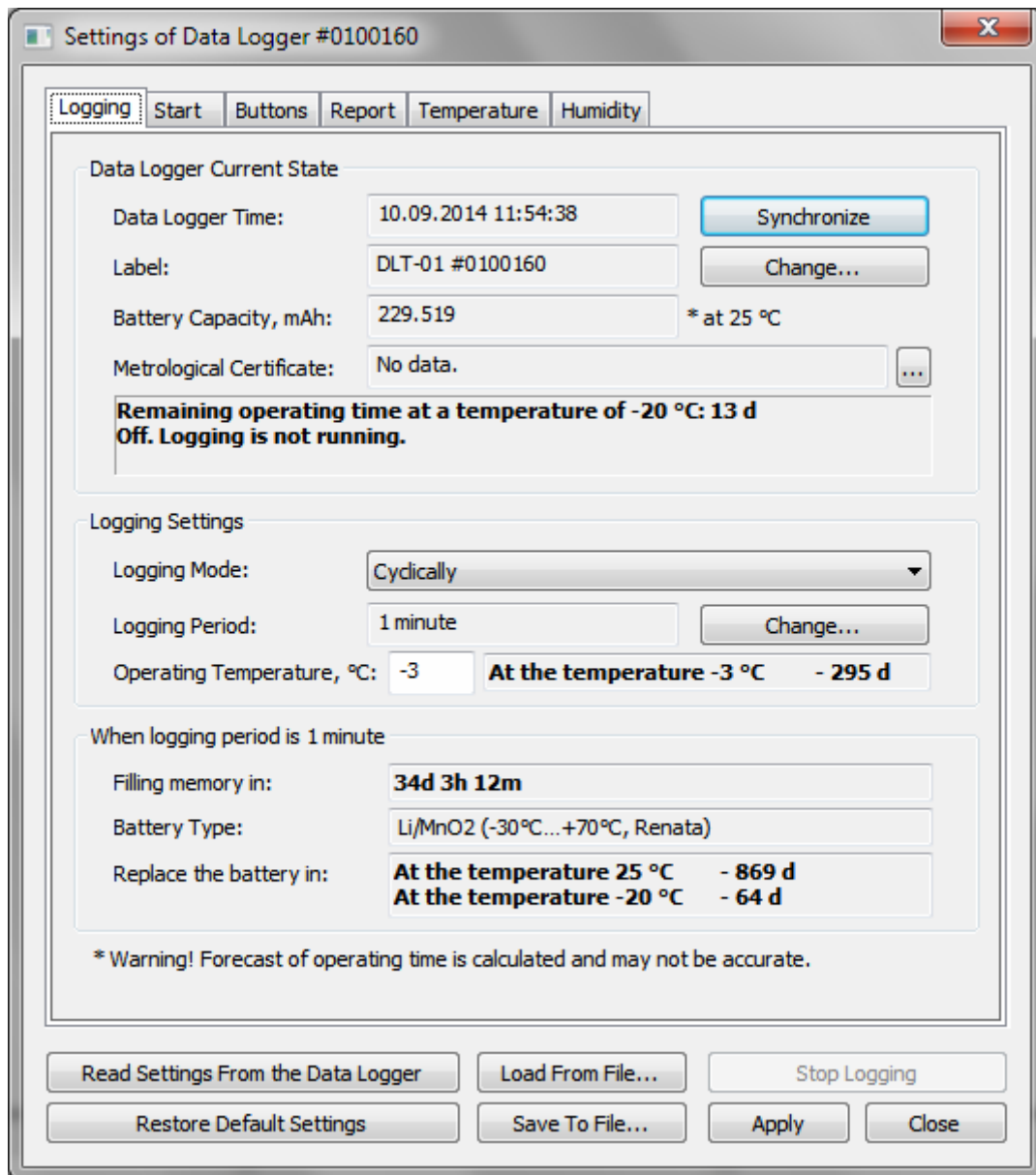


Figure 66. Settings of Data Logger. Logging tab

The **Logging Settings** contains settings that relate to the data logging.

The **Logging mode** field displays the mode in which the logger should perform logging. The mode is selected using the drop-down list. In the list, there are two modes: **Cyclically** and **Till the memory full**.

In the **Cyclically** mode a data logger will record continuously. After filling all the memory, the oldest data will be overwritten with a new one.

In the **Till the memory full** mode a data logger will record since the start of logging (please refer to **Start Tab**) and fill up all the memory. After filling all the memory, the logging process will be stopped.

The **Logging period** field specifies the current logging period of the data logger. To change the logging period, click the **Change...** button next to the field. The **Set Logging Period** dialog box will appear. The example of the dialog is shown in Figure 60 (please refer to **Changing the Logging Period**).

The **Operating temperature** field indicates the ambient temperature at which it is expected to operate the data logger. The program automatically calculates a predicted time to discharge the battery at the same temperature.

**WARNING!** The data logger operation depends on the ambient temperature, since at low temperatures the battery capacity reduces. Therefore, during data logger configuration pay attention to the predicted operating time to replace the battery. In the **Operating temperature** field specify the temperature at which the data logger is supposed to be used. If the data logger is supposed to be used in a certain temperature range, it is necessary to indicate the lowest temperature in this range. If the

predicted time of the data logger at the operating temperature is comparable or less than the time during which the data logger is supposed to be used, the data logger cannot be used. Should either increase the logging period, or replace the battery.

The **When logging period...** section contains important information about the data logger. The information depends on the logging period.

The **Filling memory in** field displays the estimated time of data logger complete memory at a specified logging period.

**WARNING!** If the complete memory time is comparable or less than the time during which the data logger is supposed to be used, increase the logging period.

The **Battery type** field indicates the type of battery that uses the data logger. If the battery type is unknown, this field will display the text: **0. This type is not supported.**

The **Replace the battery in** field displays the predicted operating time period of data logger at the specified logging period. The predicted operating time is specified for the two ambient temperatures: 25°C and -20°C.

**WARNING!** The predicted operating time is estimated and may not be accurate.

## Start Tab

The Start tab contains settings that relate to the start of logging process (Figure 67).

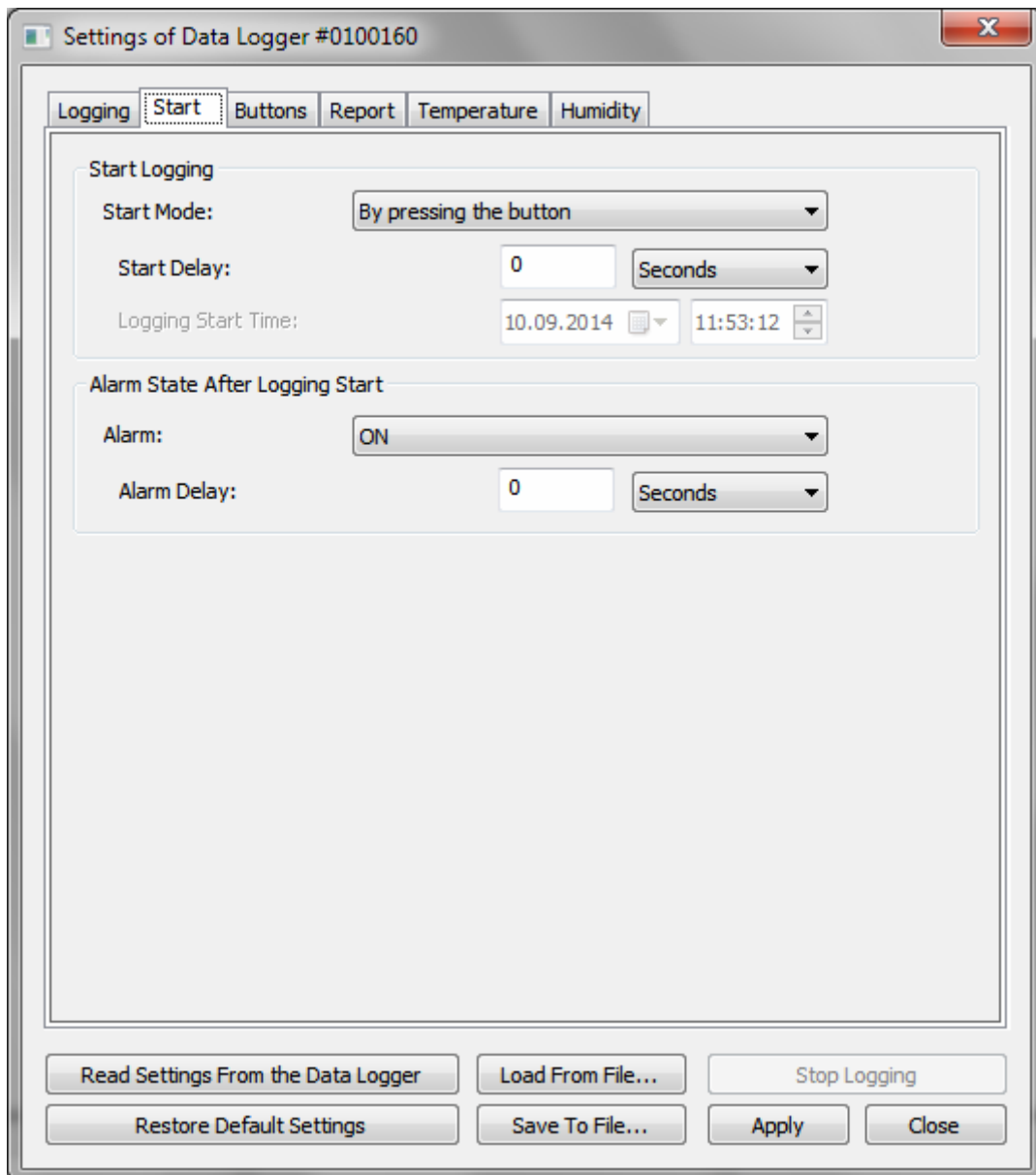
In the **Start Mode** field specify a start mode of the logging process. This field is represented as a drop-down list. There are three options in the list: **After setting up**, **By pressing the button** and **At the specified time**.

When selecting **After setting up**, the logger will start logging as soon as the new settings will be written to it. For this mode, it is possible to set the delay start.

When selecting **By pressing the button**, click the button on the data logger to start the logging process. For this mode, it is possible to set the delay start.

When selecting **At the specified time**, the logging process will automatically start at the specified time. This time is set on the same tab in the **Logging start time** field.

In the **Start Delay** field specify a start delay, which is valid for **After the specified time** and **By pressing the button** modes. If the delay is set, the logging will not begin immediately after setting up or pressing the button, but only after the delay time after when the relevant event occurs. To set the start delay, enter an integer numeric value and select the units in which the delay is measured. To select the delay unit, use a drop-down list. The list includes the following units: seconds, minutes, hours and days.



**Figure 67. Settings of Data Logger. Start tab**

The **Alarm State After Logging Start** contains settings of alarm start.

In the **Alarm** field specify the initial state of alarm after the logging start. To select the initial state, use the drop-down list. The list has two states: **ON** and **OFF**.

If **OFF** is selected, the data logger will record the sensor readings, but will not control them.

If **ON** is selected, the data logger will record and control the sensor readings.

During the operation of data logger, switch it from the **OFF** to **ON** and vice versa using the button, if it is allowed in the settings (please refer to **Buttons** tab).

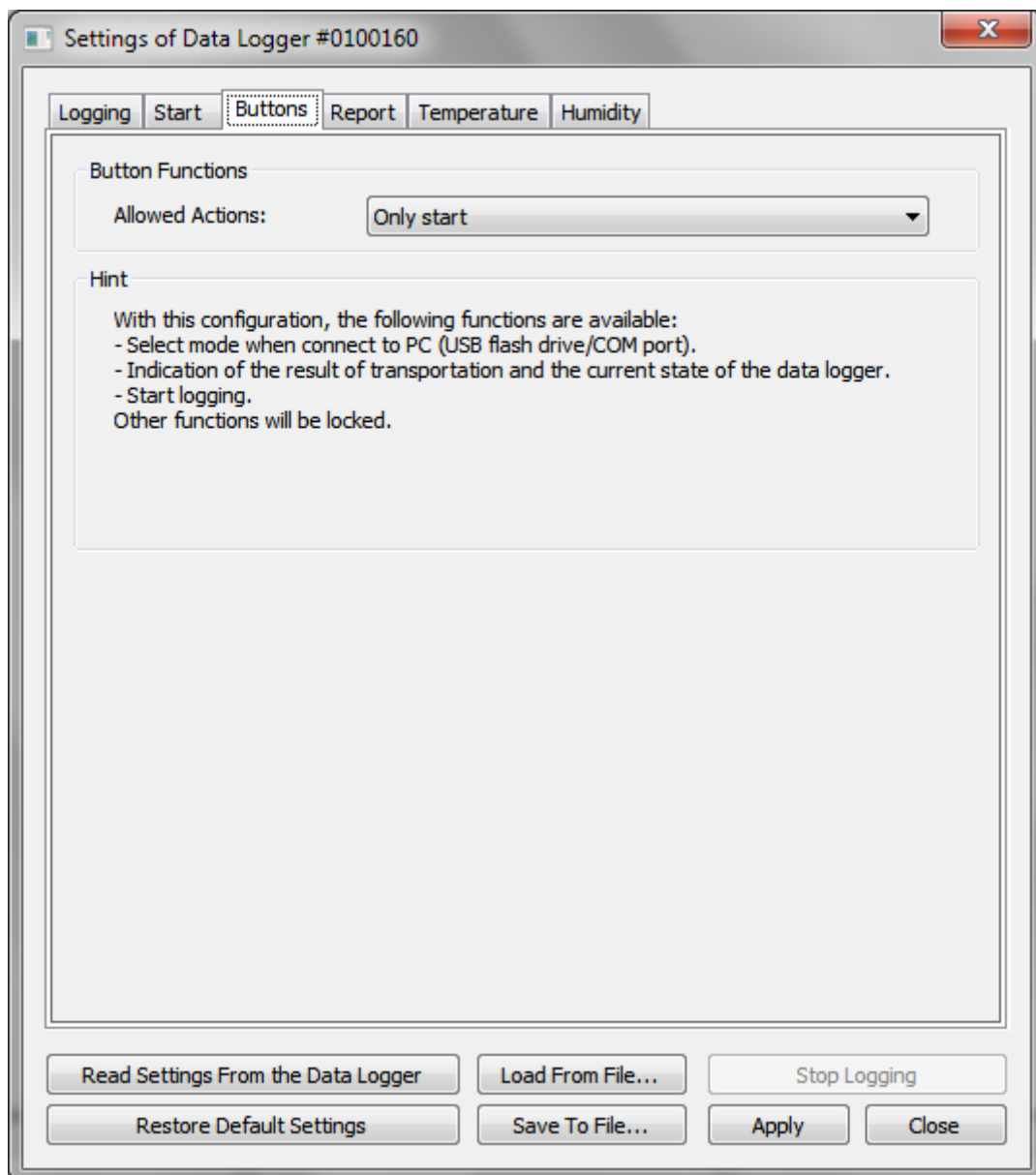
To switch to **ON** mode, the delay can be set. The delay is specified in the **Alarm Delay** field. To set the delay, enter an integer numeric value and select the units in which the delay is measured. To select the delay unit, use a drop-down list. The list includes the following units: seconds, minutes, hours and days. If the delay is set, the data logger status will be **ON** not immediately after pressing, but only after the delay time.

## Buttons Tab

The **Buttons** tab contains settings for data logger buttons (Figure 68).

The settings are in the **Button Functions** section, and the description of the current settings is in the **Hint** section.





**Figure 68. Settings of Data Logger. Buttons tab**

In the **Allowed Actions** field set the limitation of actions that can be performed using the data logger buttons. The field is designed as a drop-down list. The list contains the following options: **Only indication**, **Only start**, **Only one delivery** and **No limits**.

If **Display only** is selected, it is only possible to indicate the data logger current state and the results of transporting cargo using the buttons. Other actions will be blocked.

If **Only start** is selected, apart from the indication, it is possible to start the logging process using the buttons. Other actions will be blocked.

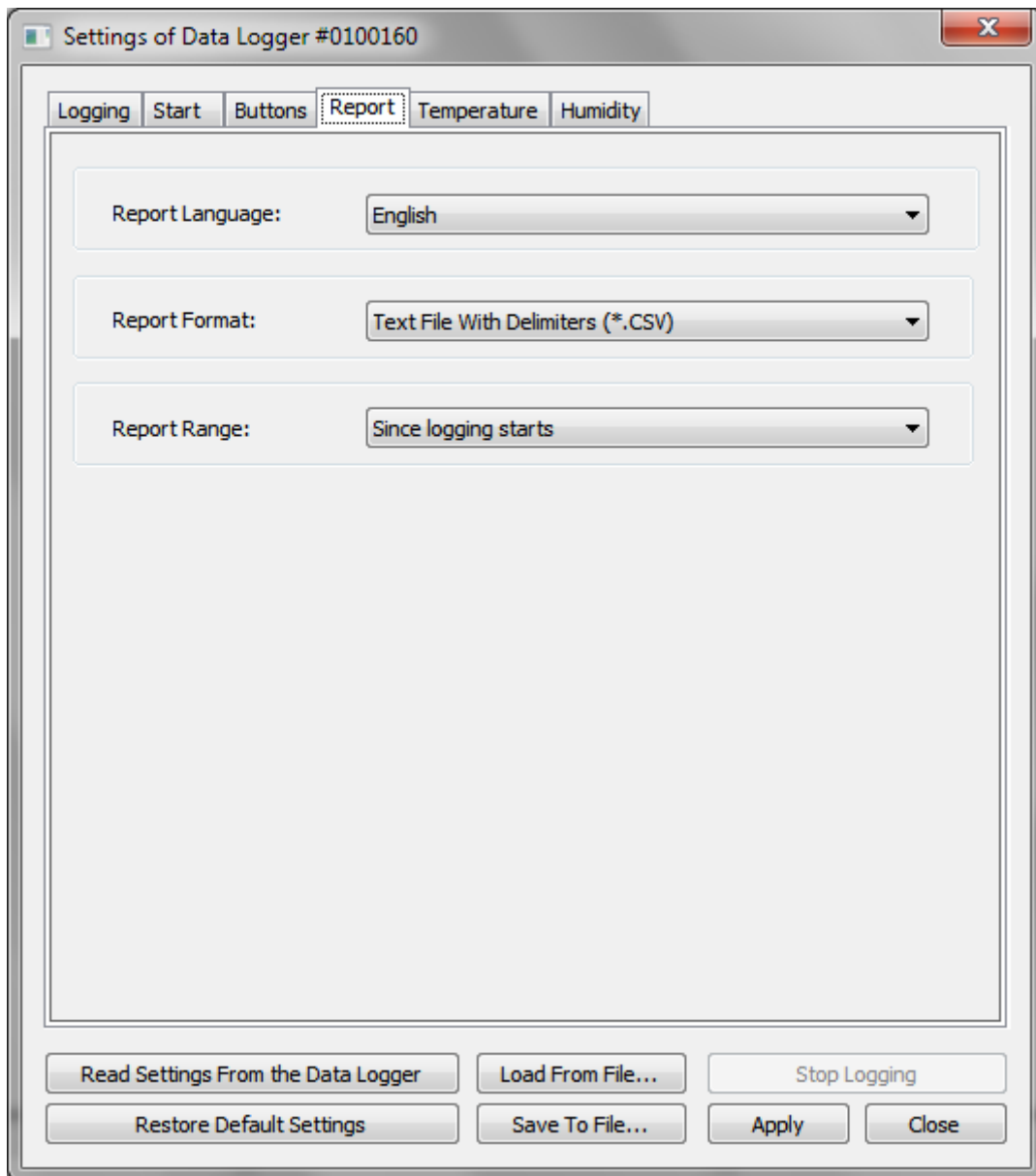
If **Only one delivery** is selected, apart from the indication and logging process start, the function of switching the alarm state modes will be available. But at the same time, the alarm can be switched on only once.

If **No limits** is selected, any action is available using the buttons. They are indication of the current logger state and transportation results, the logging process start, switching the alarm state unlimited number of times.

## Report Tab

The **Report Tab** contains settings for parameters of a report which is generated when the data logger is connected to the computer in the Flash Drive mode (Figure 69).

The **Report Language** section allows to specify the language in which the report will be formed. By default, the data logger forms a report in Russian. The list of available languages is in the drop-down list which depends on the firmware of the specific data logger.



**Figure 69. Settings of Data Logger. Report tab**

The **Report Format** field specifies the file format for a report. The field has a drop-down list which contains the following variants: **Text File With Delimiters (\*.CSV)**<sup>1</sup> and **PDF File (\*.PDF)**. This field may be inactive depending on the firmware of the specific data logger.

The **Report Period** field specifies the period for which the report should be generated. The field has a drop-down list which contains the following variants: **Since logging starts** and **Last alarm session**. In the first case, the report will be created from the logging start till the report generation, i.e. all accumulated data. In the second case, the report will be created from the last time the alarm was turned on till the time it was turned off or till the report generation, if the alarm has not been turned off yet.

## Measuring Channel Tabs

Measuring channels tabs (Figure 70 - Figure 72) are identical for all data logger channels. Tab names correspond to the names of logical parameters, which in turn correspond to a particular measuring channel of the data logger (please refer to **List of device logical parameters**).

The **Units of Measurement** section contains fields for setting measuring units and multiplier values of the channel. Both fields are designed as drop-down lists. The contents of the fields depend on the firmware of the specified data logger.

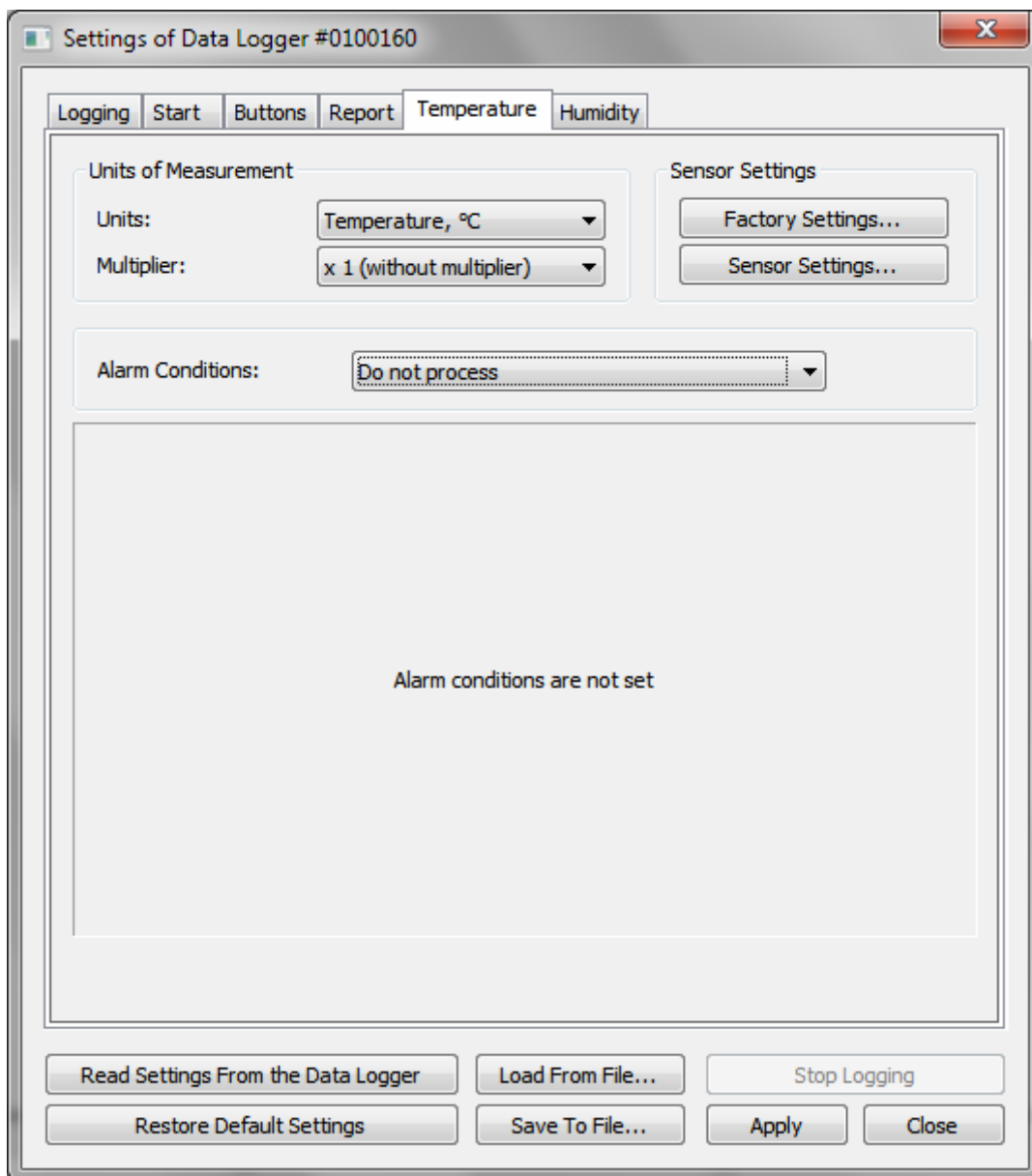
<sup>1</sup> CSV (Comma-Separated Values) — text format for presenting tabular data. Each file line is one row of the table. Values of separate columns are separated by delimiters.

The **Sensor Settings** section contains two buttons for settings of the current measuring channel. The **Sensor Settings** button opens the **Settings of the Channel** dialog box (Figure 73 and **Sensor Settings Dialog Box**).

If the user with the rights to perform the factory setting logged into the program, the **Factory settings...** button will also be available on the dialog box. Clicking on this button opens a dialog box of factory settings of the current measuring channel.

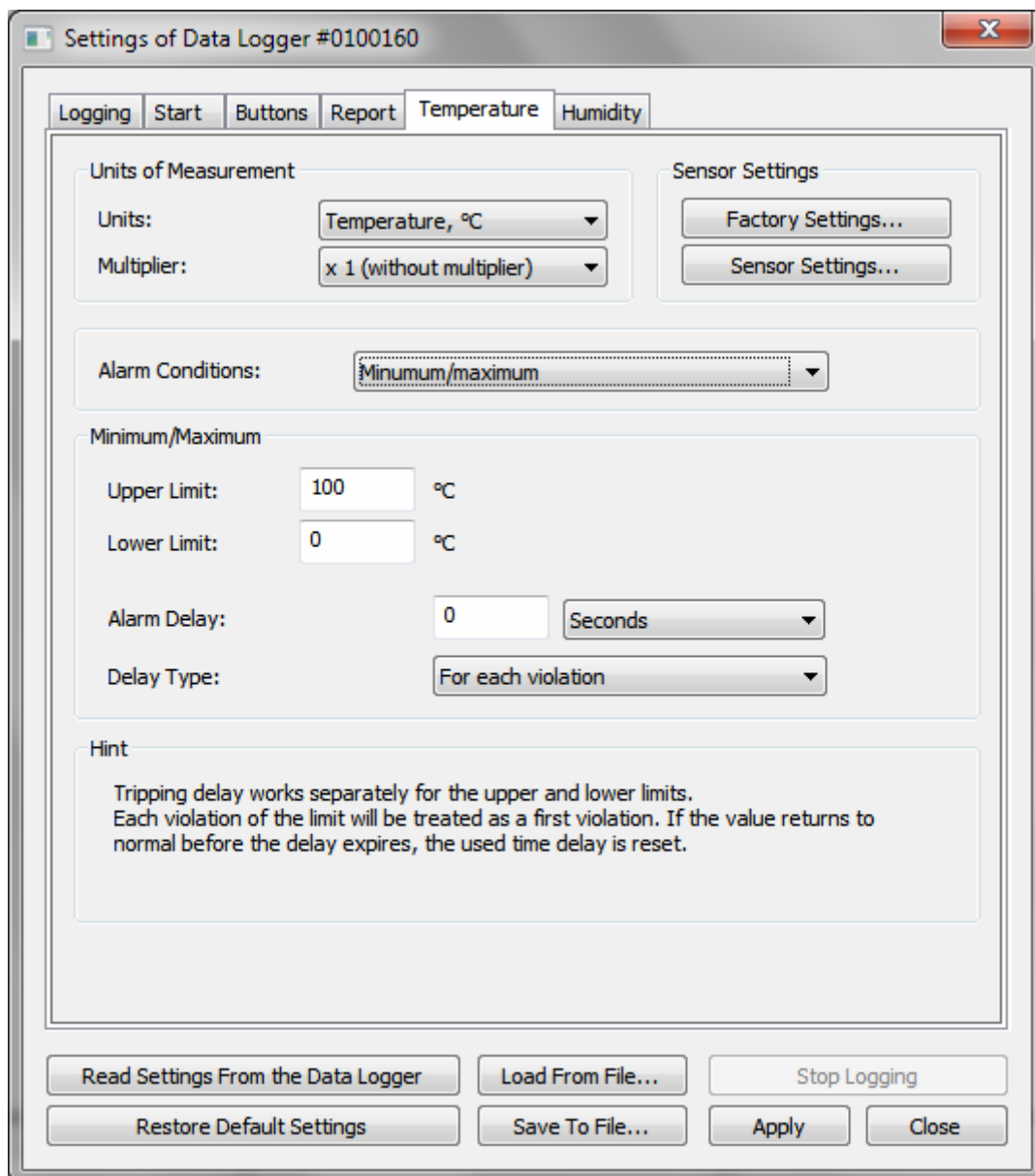
Tab view depends on the selected option of alarm conditions. It is selected using the drop-down list in the **Alarm Conditions** field. The drop-down list has three options: **Do not process**, **Minimum/Maximum** and **Multilevel**. Alarm condition is the criterion by which the data logger will evaluate the result of cargo transportation.

If **Do not process** is selected, the tab will take the form shown in Figure 70. The data logger will only record the readings of the measuring channel without checking the value of these readings.



**Figure 70. Measuring Channel Tab. Alarm conditions are not set.**

If **Minimum/Maximum** is selected, the tab will take the form shown in Figure 71.



**Figure 71. Measuring Channel Tab. Minimum/Maximum**

The **Minimum/Maximum** section indicates the upper and lower limits of acceptable values for this channel. If limits are violated, the data logger will record the relevant events in the Log, and accumulate statistics. These statistics will be used later to form the results of cargo transportation.

In the **Alarm Delay** field specify the alarm delay when the limits of permissible values are violated. Delay works as follows. If the limit is violated for a time greater than the delay, the alarm will be triggered and the result of cargo transportation will be negative. If the channel reading returns within the acceptable values earlier than the time runs out delay, the alarm won't be triggered and the result of cargo transportation will be positive. To set the alarm delay, enter an integer numeric value and select the unit in which the delay is measured. To select the delay unit, use a drop-down list. The list includes the following units: seconds, minutes, hours and days.

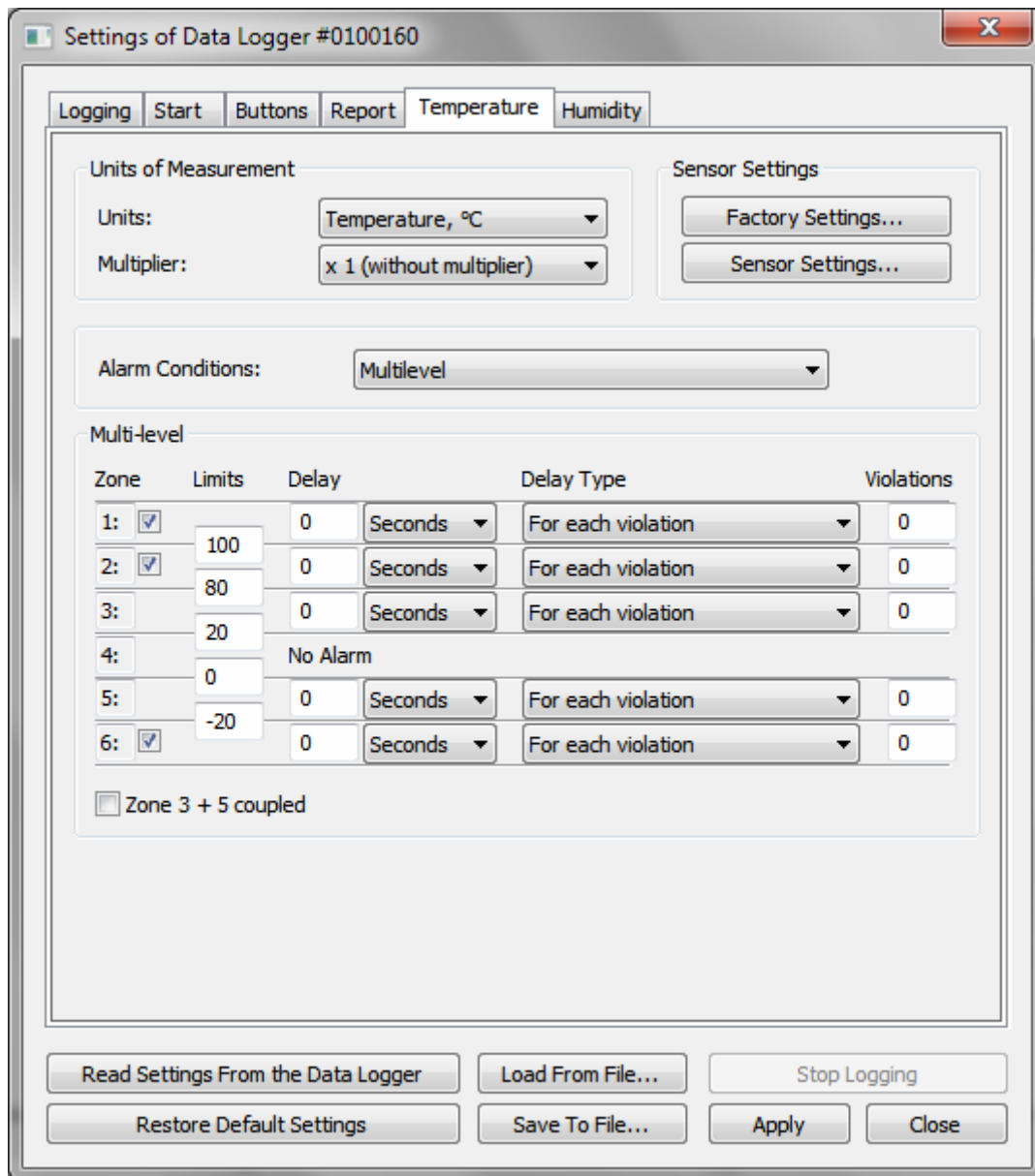
**NOTE.** This delay is valid for separate upper and lower limits of permissible values.

In the **Delay Type** field choose the following options in the drop-down list: **For each violation** and **Total for all violations**. If **For each violation** is selected, the alarm delay works for each violation of the limit. I.e. after the reading is returned within the acceptable limits, the used delay time will be zeroed.

If **Total for all violations** is selected, the alarm delay is applied to all limit violations as follows. Time for which the limit was violated is subtracted from the remaining alarm delay time. As a result, if the total time of all violations exceeds the alarm delay time, the result of cargo transportation will be negative. If the total time of all violations does not exceed the alarm delay time, the result of cargo transportation will be positive.

The **Hint** section displays information about the selected delay type.

If **Multilevel** is selected in the **Alarm Conditions** field, the tab will take the form shown in Figure 72.



**Figure 72. Measuring Channel Tab. Multilevel alarms.**

Multilevel alarm mode splits the alarm condition into 6 independent zones. **Zone 1** represents the range of highest values. **Zone 6** is the range of minimum values and **Zone 4** is the range of acceptable values. The following parameters are specified for each zone: limits, delay time, delay type and permissible number of violations. While inspecting the cargo transportation, the data logger will analyze the statistics for each zone separately and if the alarm is triggered at least in one area, the result of cargo transportation will be negative. If there is no alarm in any area, the result of cargo transportation will be positive.

Zone limits are specified in the fields located at the intersection of areas.

To set the delay, enter an integer numeric value in the **Delay** field and select the delay unit using a drop-down list. The list includes the following units: seconds, minutes, hours and days.

In the **Delay Type** field choose the following options in the drop-down list: **For each violation** and **Total for all violations**. Processing of delay type is similar to the processing of delay type in the **Minimum/Maximum** alarm mode (see above).

In the **Violation** field set the allowable number of limit violations. This setting is independent of the alarm delay. If the zone limit is broken more times than specified in the field, this zone will trigger an alarm, regardless of whether delay time out or not.

If there is no need in all zones, **Zone 1**, **Zone 2** and **Zone 6** can be turned off. To do this, uncheck the corresponding zone.

**Zone 3+5 coupled** can extend the zone of permissible values. If this checkbox is checked, the zone of acceptable values includes **Zone 3**, **Zone 4** and **Zone 5**.

## Sensor Settings Dialog Box

The Sensor Settings dialog box is presented on the Figure 73.

The **Sensor** section contains **Sensor Type** field. The field is designed as a drop-down list. The list contents and its availability depend on the specified data logger and the measurement channel.

The **Correction** section includes **Incline** and **Offset** fields. These are coefficients which are used to correct the deviation of the sensor from the sample. These fields are available depending on the data logger and measurement channel.

Figure 73. Settings of the channel

The **Zooming on a scale** section contains **The upper limit of scale** and **The lower limit of scale** fields which are used to scale the values of analog sensors. These fields are available depending on the data logger, measurement channel and sensor type.

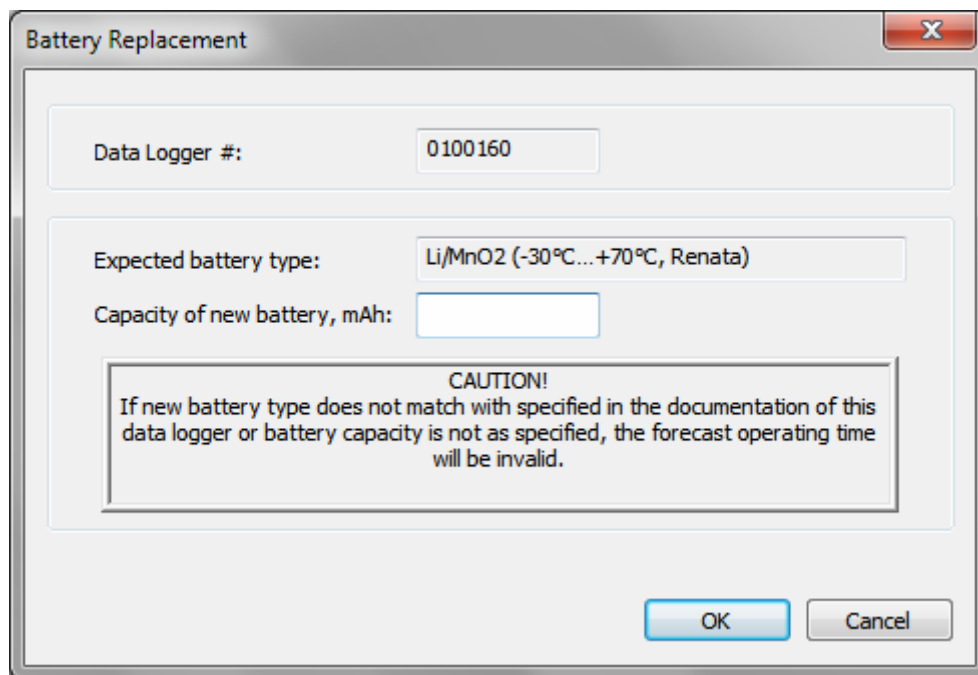
## Replacing the Battery

**NOTE.** Function of battery replacement is only available for DLT series data loggers.

This operation should be performed after the battery is physically replaced in the data logger. The operation is necessary for the correct prediction of the remaining data logger time.

**WARNING! Be extremely careful when choosing and replacing the battery. In case of error, the prediction of the remaining data logger time will be unreliable.**

For battery replacement use the **Battery Replacement...** command in the **Connected Devices** main menu or data logger context menu (please refer to **Connected Devices Menu** and **Data Logger Context Menu**). The **Battery Replacement** dialog box will open (Figure 74).



**Figure 74. Battery Replacement**

The dialog box contains the serial number of the data logger and the expected type of battery. Enter the capacity of new battery and click **OK** to perform the operation, or **Cancel** to close the dialog box without performing the operation.

**WARNING! If the battery of another type is inserted to the data logger, the prediction of the remaining data logger time will be unreliable.**

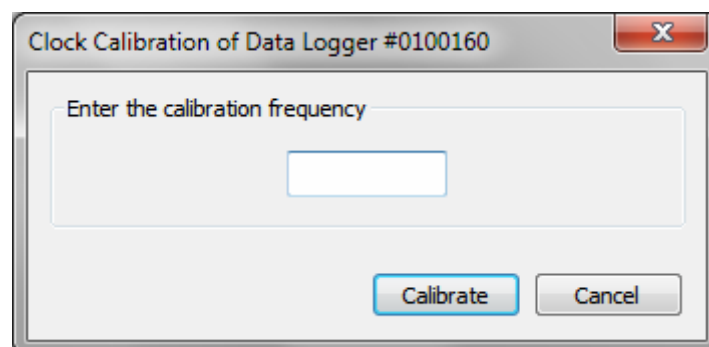
**WARNING! If the capacity of a new battery will be more than factual, the prediction of the remaining data logger time will be unreliable.**

## ***Clock Calibration***

**Note.** The clock calibration is available only for DLT series data loggers.

To calibrate the data logger clock, it is necessary to enter the program as the user with the right to run the factory settings.

Then use the **Clock calibration** command in the **Connected Devices** main menu or data logger context menu (please refer to **Connected Devices Menu** and **Data Logger Context Menu**). The **Clock calibration of the logger** dialog box will open (Figure 75).



**Figure 75. Clock calibration of the logger**

Enter the calibration frequency in the field and click the **Calibrate** button to calibrate a data logger or **Cancel** to close the window without calibration.