

LKDSDisp: Client-Server Software for LMDS

Configuration & Usage Guide

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This manual contains description of the software that allows client-server approach to upper-tier software architecture of LMDS (Lift Monitoring and Diagnostics System)

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Introduction

The growing tendency of today is having several clients in one LMDS network. 'A client' here means a computer that is able to run the MPultPro module showing the status of lifts. This tendency arose due to the desire of users to have consolidated (integrated) dispatcher control rooms and current information, to the desire of maintenance services to have live diagnostics data and to make use of accumulated data alongside with dispatcher control rooms.

Using LKDSPro allows having several clients in one LMDS network, with certain inconveniences though:

1. Each client accumulates data (logs, drives operation statistics, status of sensors at failures) independently of other clients. In order to receive the always-submitted data MPultPro must be always on. The permanent on-state of MPultPro can be awkward in itself when the software is installed on the principal's computer; besides, the amount of information being exchanged with the lift unit is increasing.
2. When replacing lifts, connection parameters also have to be changed.
3. Any changes in lift unit's description, in lifts' and lift units' parameters (such as description of user inputs and outputs, reassignment of reserved state of lift unit), in service keys' description (reassignment of their ownership by a mechanic) must be made on each computer separately.
4. There is no possibility to differentiate the rights of clients as concerns their access to lifts and the type of such access, for example, whether lift units can be tuned or microchips changed.

Only server (host-based) solution lacks the above drawbacks. In this case there is only one data collection server in the network, and all other computers are connected to the server to display operational and collected information.

General requirements

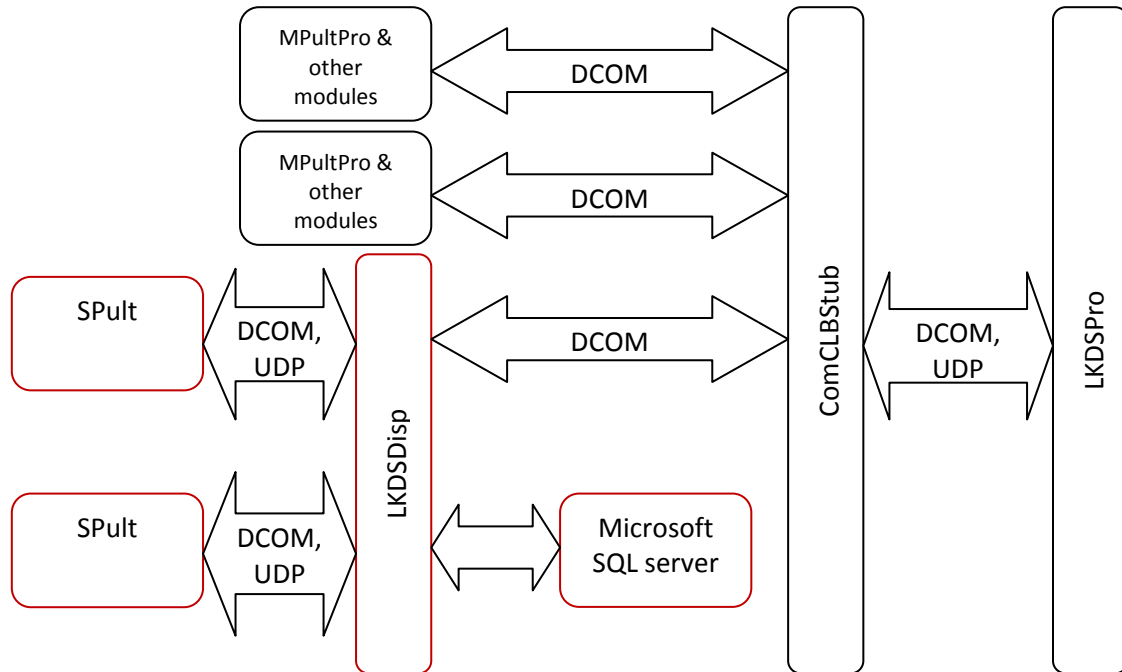
General requirements to data collection server:

1. When possible, make use of already available software.
2. Secure storage of accumulated data, quick access to and filtering of data.
3. Availability of remote connection of clients to the server via Internet network.
4. Simple procedure of assignment of access rights.

Server-side data collection

Data collection server of lift monitoring and diagnostic system (LKDSDisp) has been implemented as a Windows OS service. LKDSDisp does not interact immediately with LMDS equipment. Data exchange is enabled through LKDSPro service. In particular, LKDSDisp is

connected to ComCLBStub server like other applications (MPultPro, etc.). In fact, LKDSDisp can be considered a part of MPultPro software which runs logging and data exchange with lift units. A part of MPultPro software that interacts with an operator (a person) is separated to become a SPult module. There can be one LKDSDisp server but several simultaneously connected SPult modules. Interaction of software components is shown in the picture below:

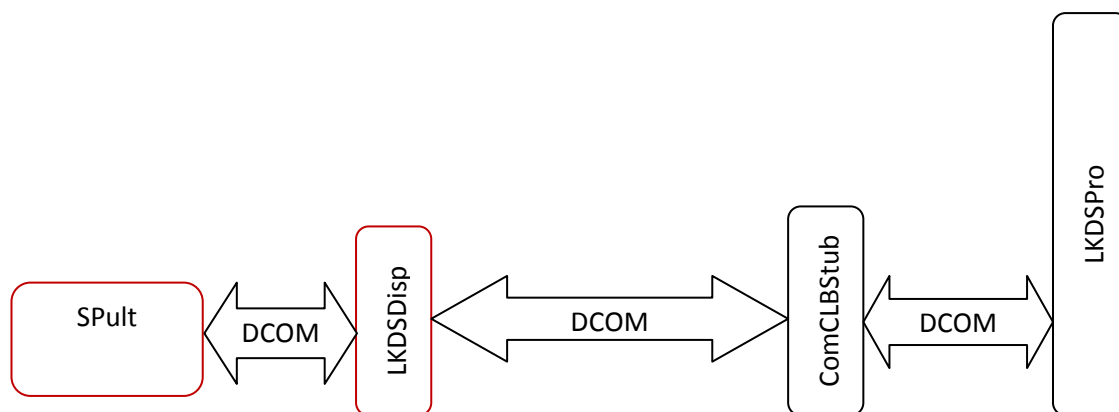


LKDSDisp runs logging and storing of the descriptive (configuration) part in the database of Microsoft SQL server.

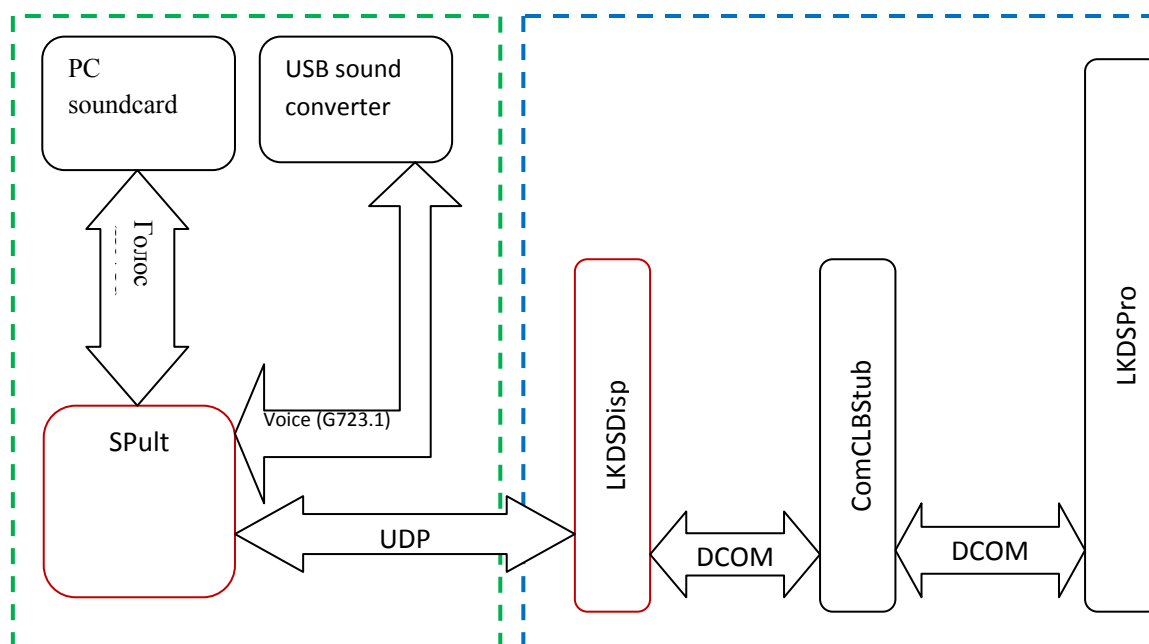
Using a Microsoft SQL server:

- 1) increases reliability of data storage;
- 2) increases overall performance of the system;
- 3) allows other software tools to have access to accumulated data and configuration to run reports and system performance analysis.

SPult is connected to LKDSDisp only. If SPult is run on one computer with LKDSDisp and if the interaction of SPult with LKDSPro is enabled using DCOM protocol, then the interaction of software modules will be as follows:



When SPult and LKDSDisp are run on different computers using UDP protocol for SPult and LKDSDisp interaction, the software modules will interact as follows:



Installation of server-side data collection software

Installation of server-side data collection software is made by running LKDSProEN.msi installation file. After installation, the following folders will contain the data collection server files:

C:\LKDSProEN

...

|—LKDSDisp

...

|—SPult

...

LKDSDisp folder contains the following files:

LKDSDisp.exe - LKDSDisp service

LKDSDispCfg.chm

LKDSDispCfg.exe - initial configuration module

LKDSDispPS.dll

SPult folder contains the following files:

SPult.exe – lift status display module, receiving data from LKDSDisp (analogue of MPultPro).

SReport - report-making module, similar to reports obtained in the administrative mode of MPultPro.

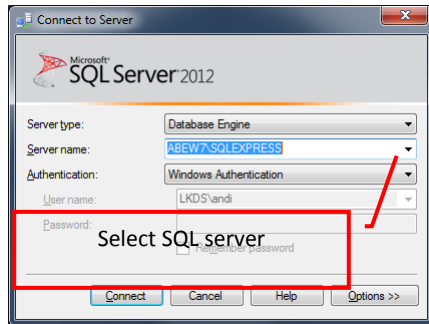
Storage of accumulated data (logs, drives operation statistics, sensors status during failures) and configuration (lifts description, description of users) is done in the database of Microsoft SQL Server. Microsoft SQL Server must be installed on the computer prior to configuring the LKDSDisp. If no SQL server has been installed yet, a free version of Microsoft SQL Server is available. This free version has a restriction on database size (10 Gb) and some restrictions on performance. Two installation files are available for downloading from official Microsoft website:

- 1) Microsoft SQL Server 2012 Express Edition (or later versions) –SQL server itself
- 2) Microsoft SQL Server Management –SQL control tool

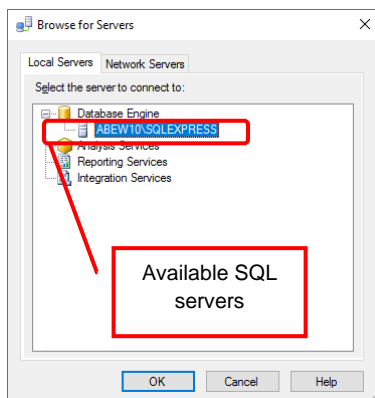
Having installed Microsoft SQL Server 2012 Express Edition and Microsoft SQL Server Management Studio please run:

"Start" \ "Microsoft SQL Server 2012" \ "Microsoft SQL Server Management Studio Express"

In the new window you will see the names of installed SQL servers.

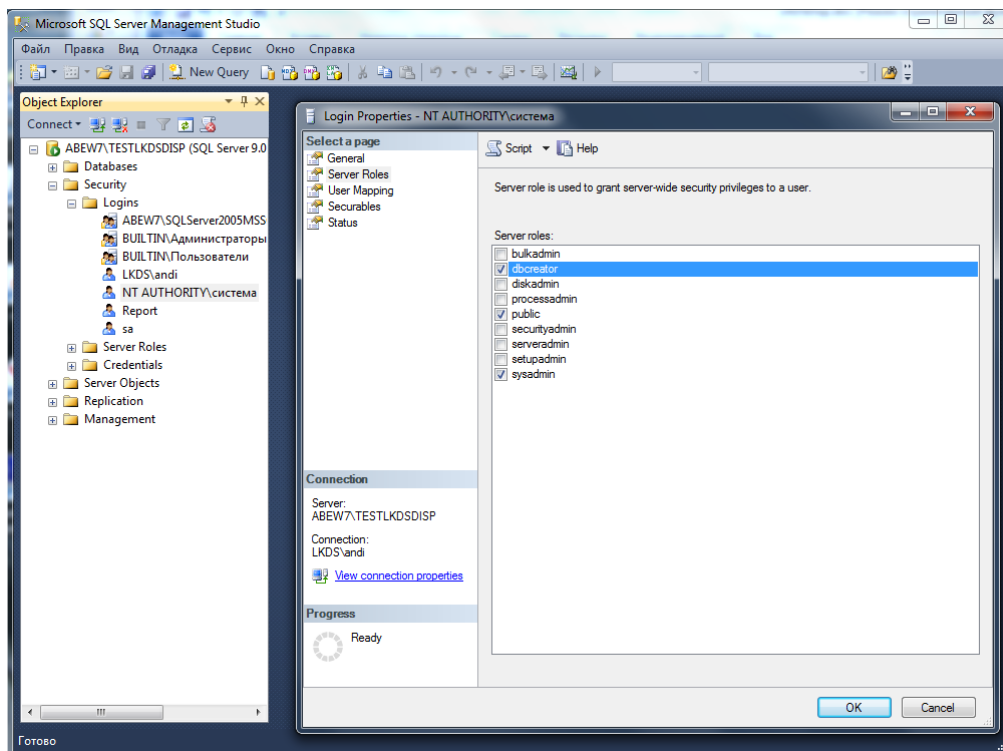


To find the available SQL server use the arrow to select a SQL server, choose <Browse to more ...>, and in the "Local Servers" folder open "Database Engine" subfolder



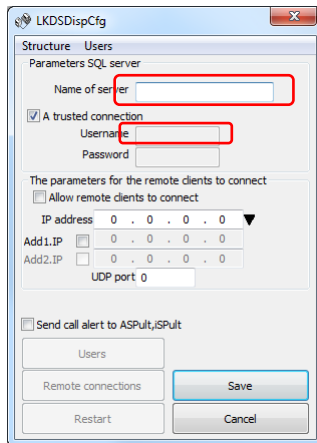
The name of the SQL server will be required later to configure LKDSDisp.

Extra settings are available here:



Initial configuration of data collection server.

After installation of LKDSDisp server, initial configuration is required. Such initial configuration means setting the name for the SQL server and for the first user that has administrative rights to run subsequent configuration. Initial configuration is done with LKDSDispCfg.exe configuration file which can be found here "LMDS" \ "Client - server solution" \ "Client - server solution - Setting (LKDSDispCfg.exe)". After starting the configurator the following dialogue panel will pop up:



Enter the name of your SQL server into "Name of server" field of "Parameters SQL server" group; do not change other fields of "Parameters SQL server" group.

The LKDSDisp server (similar to LKDSPro server) supports two types of clients' connections:

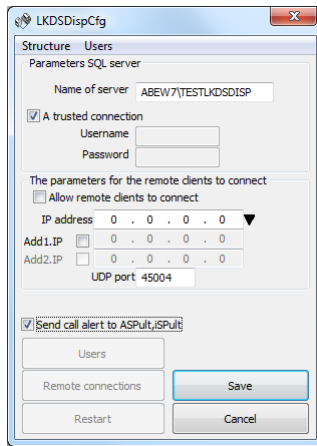
- 1) DCOM protocol, when the client and the LKDSDisp server are run on the same computer;
- 2) UDP protocol, when the client and the LKDSDisp server are run on different computers that are connected using IP.

"The parameters for the remote client to connect" group field allows using and setting parameters of UDP protocol.

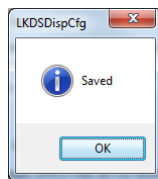
If LKDSDisp server will use UDP protocol then "Allow remote clients to connect" attribute must be flagged and UDP port numbers for data exchange must be set.

"IP address", "Add1.IP" and "Add2.IP" fields must be filled similarly to the fields of remote server access of LKDSPro. If the server computer has one network interface these fields are left blank.

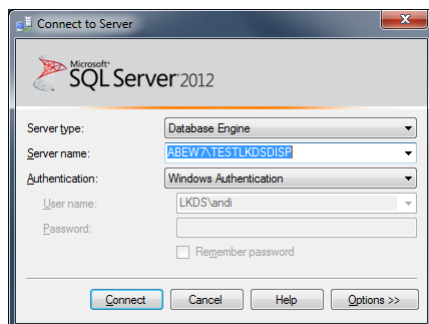
The filled-in configuration module may look as follows:



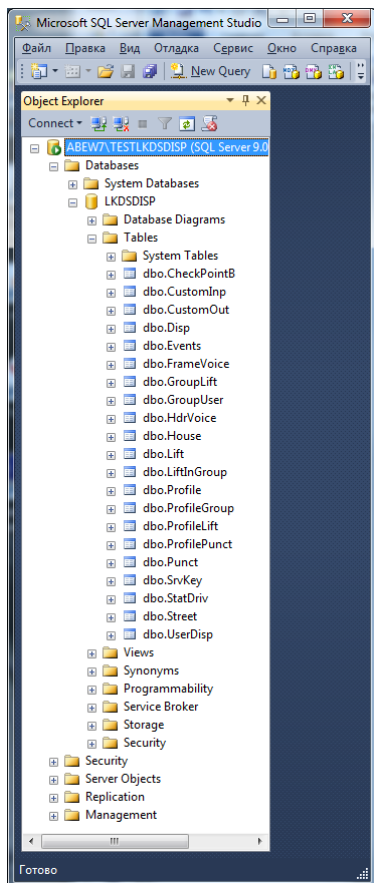
Press "Save"; when successful, the following panel will pop up:



After saving, an LKDSDisp database will be created in the SQL server. The database can be viewed with the help of Microsoft SQL Server Management Studio. To run it, choose Microsoft SQL Server Management Studio in the connection panel:

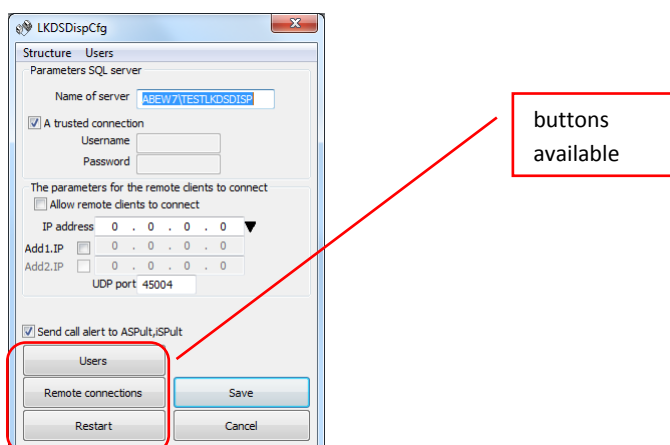


Press "Connect" to browse through database tables:

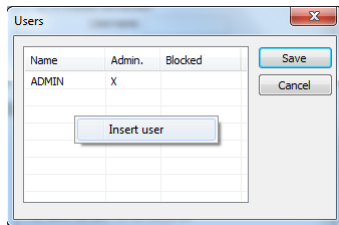


During database creation one user with administrative rights will be automatically registered, having login of ADMIN and password of ADMIN. This user will be required to access the SPult module (see below) to enter the lift units to be controlled and other parameters. You are recommended to change the password later.

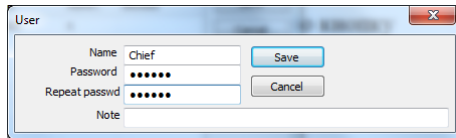
To introduce additional users who will be using SPult as operators, load LKDSDispCfg again:



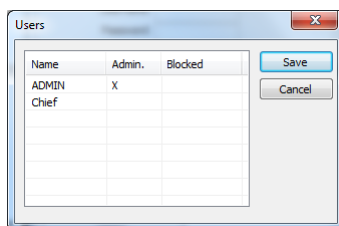
Next, press "Users", in the pop-up window press the RMB (right mouse button) and choose "Insert user":



In the next window enter the new user name and password. You can enter any name, e.g.:



After saving the user list will look like this:



Save the user list, and then save your configuration by pressing "Save" in the LKDSDispCfg configurator.

Initial configuration is done.

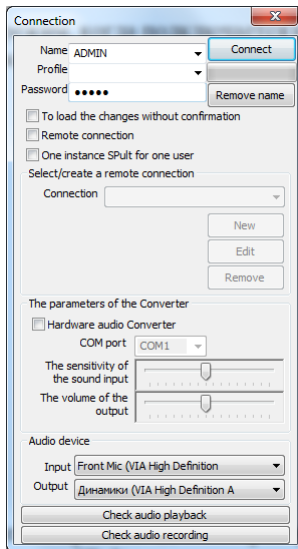
Input of lifts to be controlled.

Further setting of LKDSDisp server is done with the help of SPult.exe module which can be found in LKDSProEN\SPult folder and run by choosing "LMDS" \ "Client - server solution" \ "Client - server solution - Dispatching lifts (SPult.exe)".

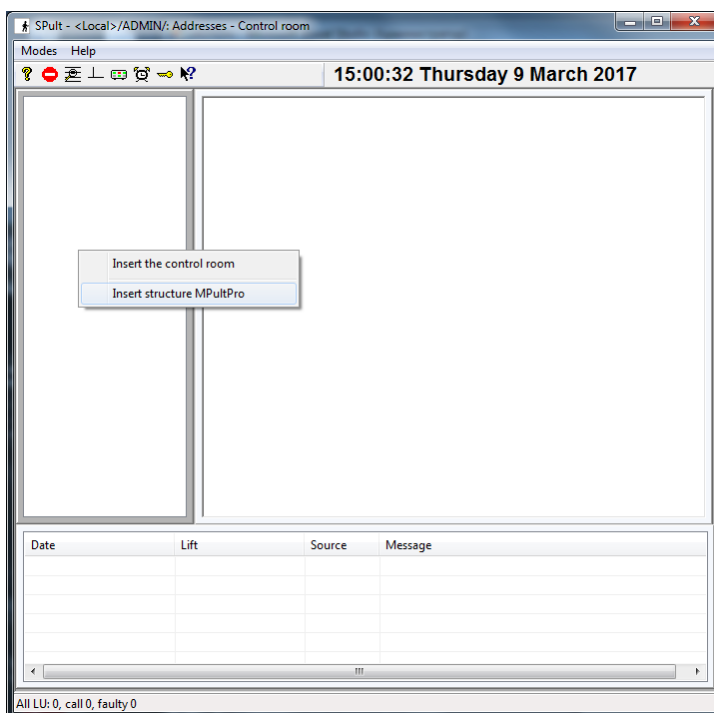
The SPult module has three operation modes:

- 1) Administrative mode – to configure/set up LKDSDisp server.
- 2) Settings mode – to configure the display (panel size, type of mapping in status panel) for a particular user using a particular computer.
- 3) Operation mode – current usage by operator.

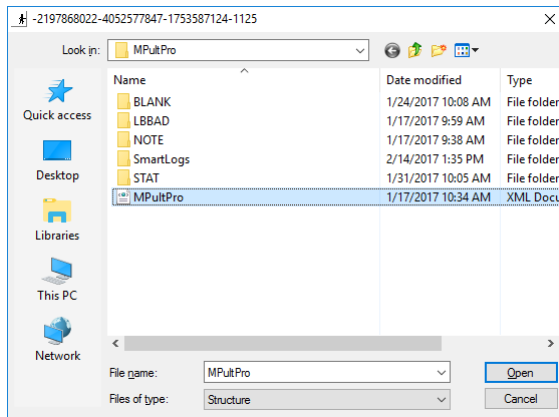
SPult will enter the Administrative mode when connecting to a local LKDSDisp under a user having administrative rights. When SPult starts, the following connection panel will pop up:



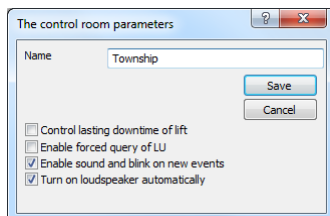
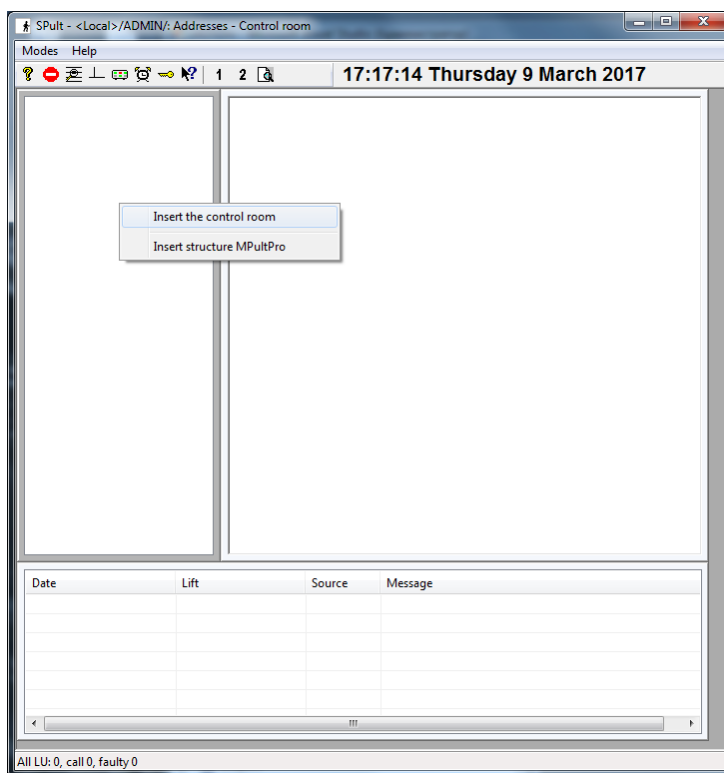
After entering the name (ADMIN) and the password (ADMIN) of a user with administrative rights press "Connect" and you will see an empty window of SPult. We will discuss "Profile" later. Using SPult is basically similar to working with MPultPro, i.e. you can manually insert control rooms' IDs, name of streets, house numbers and lift IDs. If you already have a list of lifts to be controlled in .xml file you can use this file. To do it, press RMB over your geographical structure panel and choose "Insert structure MPultPro".



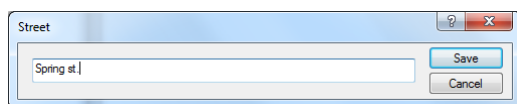
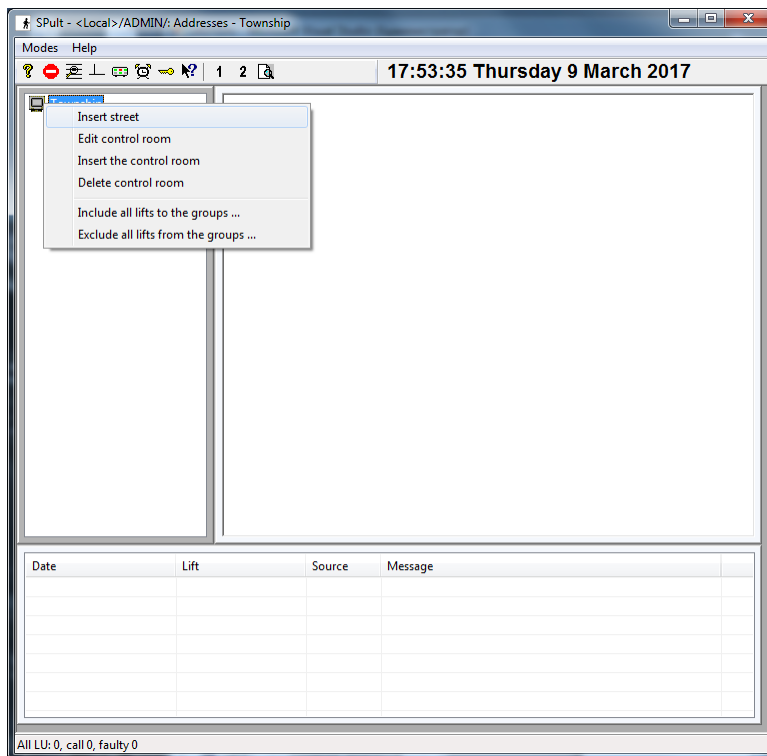
Next, choose the file and press "Open" in the pop-up panel:



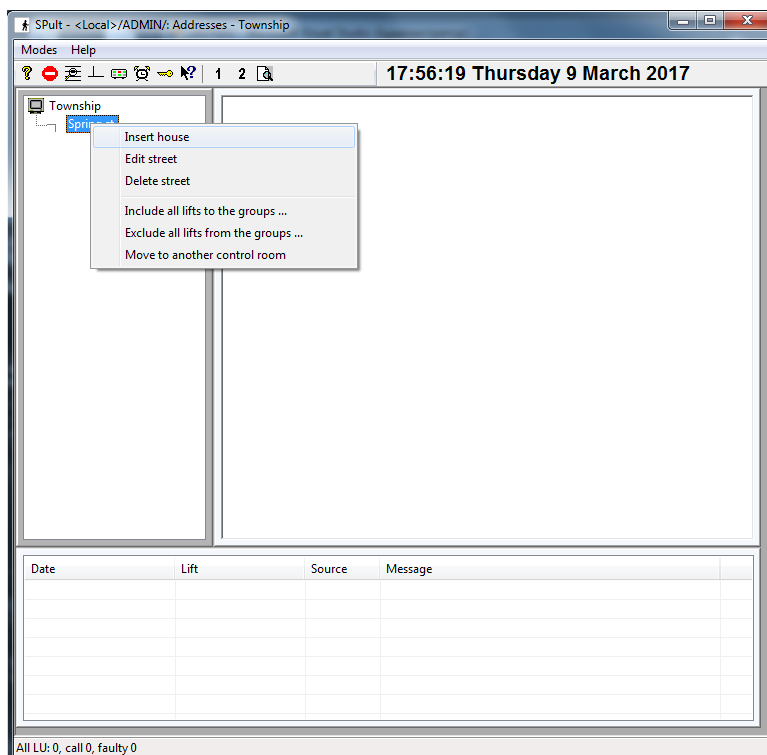
After uploading this structure will be visible in the panels of SPult. If you never used MPultPro before then you will have to manually indicate location of the structure. First, you enter the control room:

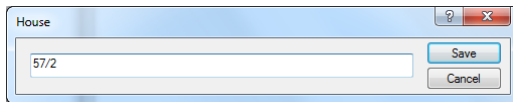


Next you enter the name of the street where you have the control room for this particular lift unit:



Next you enter the house number where you have the lift to be controlled:





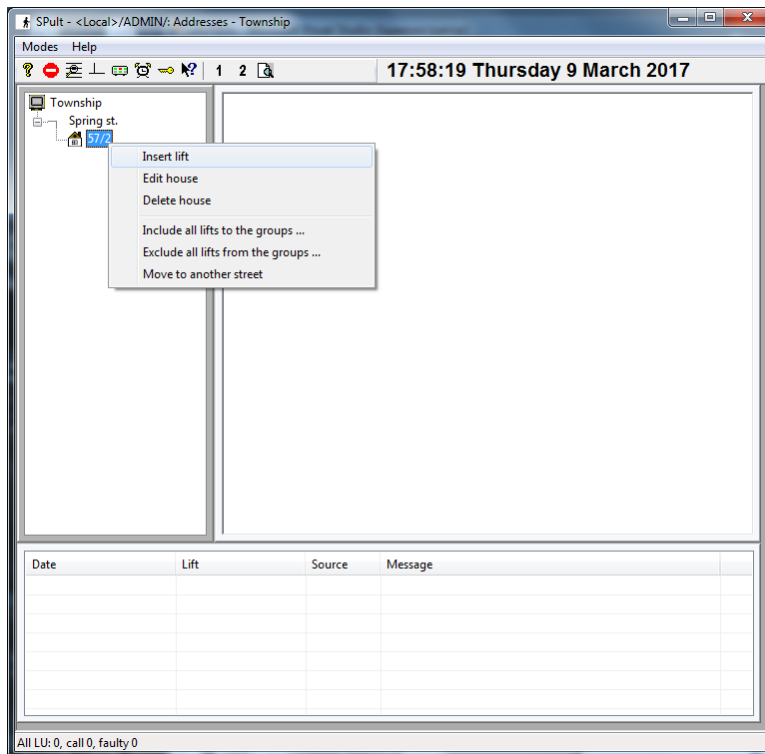
House

57/2

Save

Cancel

Finally, you enter the lift itself:



SPult - <Local>/ADMIN/ Addresses - Township

Modes Help

17:58:19 Thursday 9 March 2017

Township

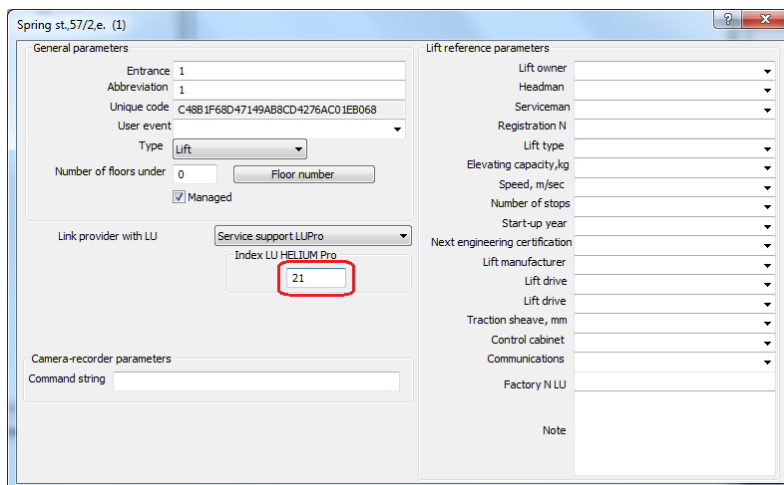
Spring st.

57/2

- Insert lift
- Edit house
- Delete house
- Include all lifts to the groups ...
- Exclude all lifts from the groups ...
- Move to another street

| Date | Lift | Source | Message |
|------|------|--------|---------|
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

All LU: 0, call 0, faulty 0



Spring st., 57/2.e. (1)

General parameters

Entrance: 1

Abbreviation: 1

Unique code: C48B1F68D47149A88CD4276AC01EB068

User event: [dropdown]

Type: Lift

Number of floors under: 0

Floor number: [button]

☒ Managed

Link provider with LU: Service support LUPro

Index LU HELIUM Pro

21

Camera-recorder parameters

Command string: [text area]

Lift reference parameters

Lift owner: [dropdown]

Headman: [dropdown]

Serviceman: [dropdown]

Registration N: [dropdown]

Lift type: [dropdown]

Elevating capacity, kg: [dropdown]

Speed, m/sec: [dropdown]

Number of stops: [dropdown]

Start-up year: [dropdown]

Next engineering certification: [dropdown]

Lift manufacturer: [dropdown]

Lift drive: [dropdown]

Lift drive: [dropdown]

Traction sheave, mm: [dropdown]

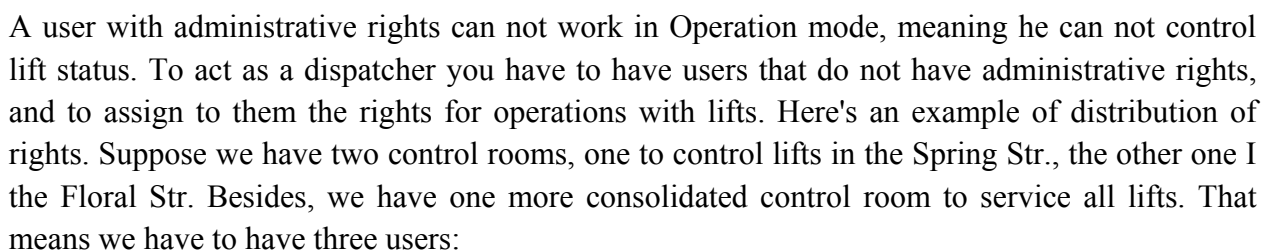
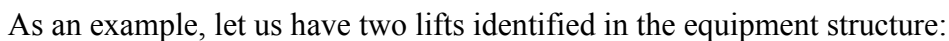
Control cabinet: [dropdown]

Communications: [dropdown]

Factory N LU: [dropdown]

Note: [text area]

The lift unit for this particular lift is identified in the "Index LU HELIUM Pro" field. You enter here the LU Index:



- 1) Spring – to see and control only lifts in the Spring Str.
- 2) Floral – to see and control only lifts in the Floral Str.
- 3) Chief – to see and control all lifts.

On the LKDSDisp server access rights are assigned not to lifts but to groups of lifts. Lifts are included into one group or into several groups.

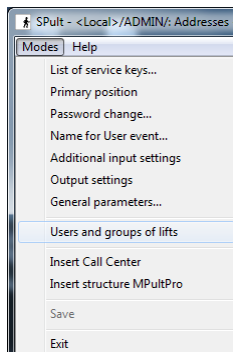
In our example we need two groups of lifts:

- 1) One group to unite lifts in the Spring Str.
- 2) Second to unite lifts in the Floral Str.

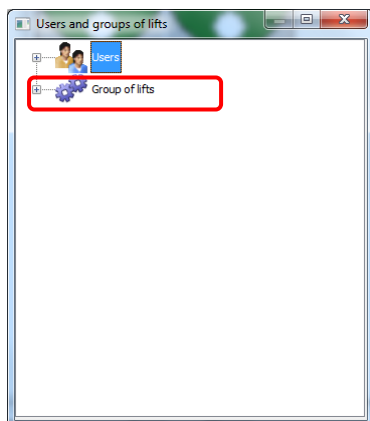
User Spring has access only to the first group of lifts, user Floral has access to the second group of lifts, and user Chief has access to both groups of lifts.

32 groups of lifts can be supported simultaneously. Number of users is not limited.

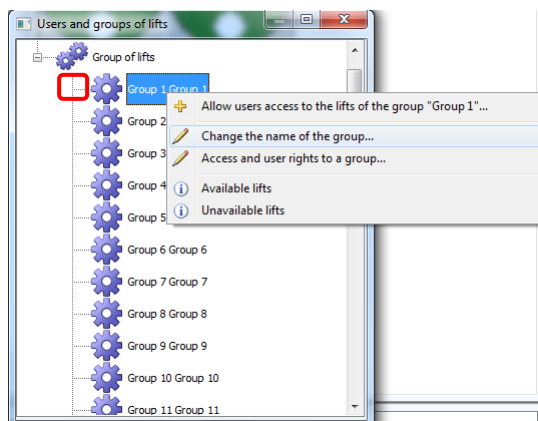
Initially, the groups are named Group 1 ... Group 32. When you choose "Users and groups of lifts" in the "Modes" menu as follows:



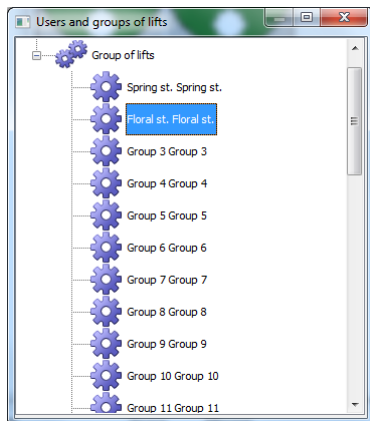
You will see this panel:



Clicking on "Groups of lifts" you will get the list of lifts:



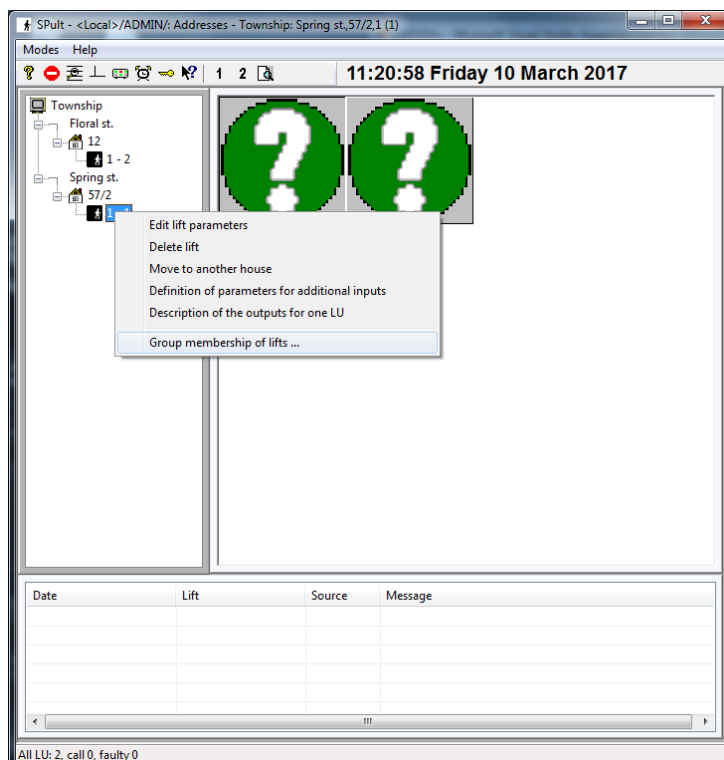
Press RMB over the line of a group, choose "Change the name of the group ..." and you will be able to change the name of the group and commentaries. Let us change the name and the commentaries as follows:



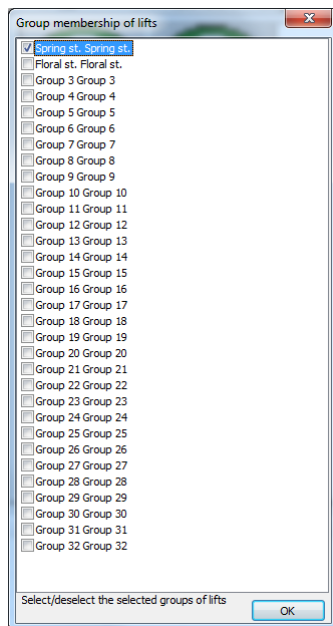
You can group lifts:

- 1) One by one
- 2) By all lifts in the house
- 3) By all lifts in the street
- 4) By all lifts of the control unit.

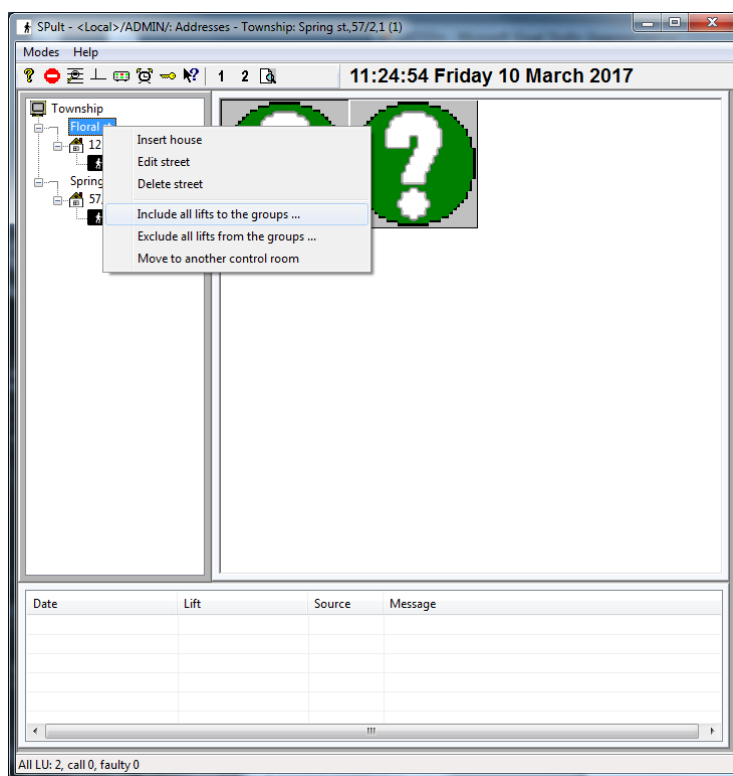
We have one lift in Spring street. To include it into a group press RMB over the line and choose "Group membership of lifts..."



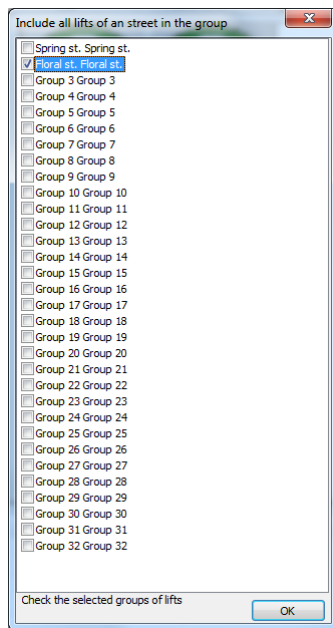
In the pop-up window flag the attribute for the group "Spring Str."



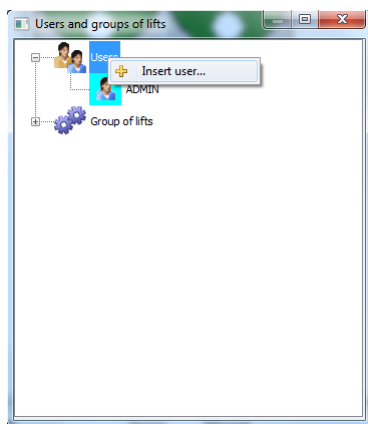
There is one lift in Floral street, too, and you can include this lift into any group, or you can assign group membership for all lifts in Floral street. Press RMB over "Floral str." and choose "Include all lifts to the groups...":



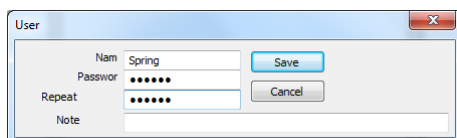
In the pop-up window flag the attribute for group "Floral str."



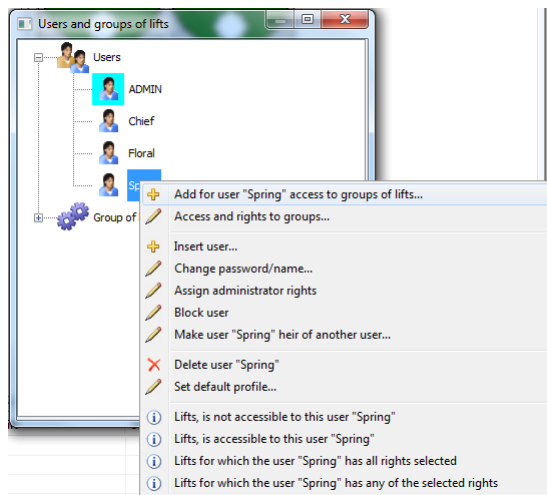
To enter new users choose "Users and groups of lifts" in the "Mode" menu of SPult, then "Users", and by pressing RMB choose "Insert user..."



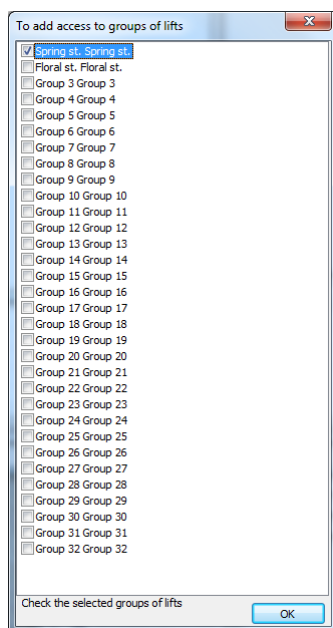
Let us introduce new users: Spring, Floral and Chief:



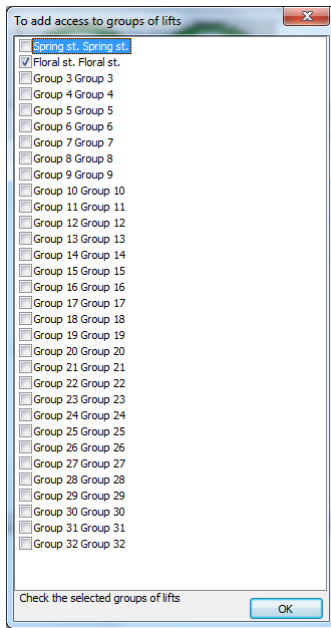
After that you must grant them access to groups of lifts:



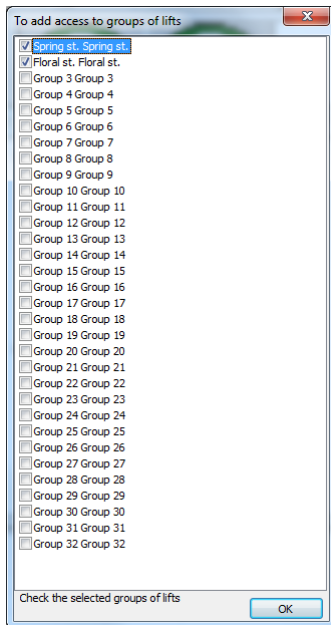
For user Spring:



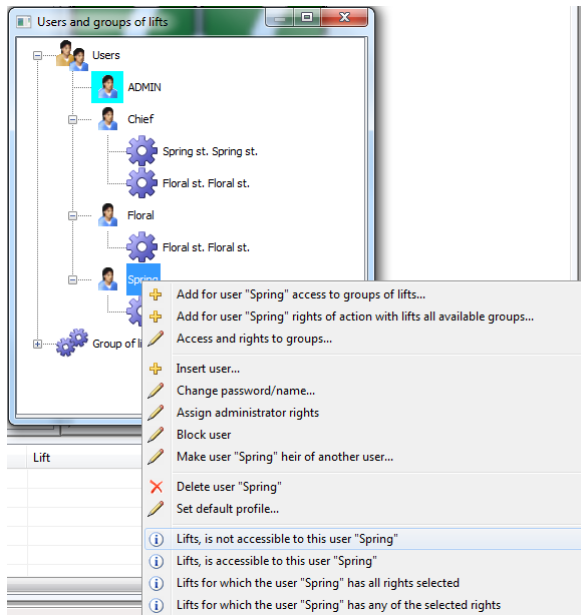
For user Floral:



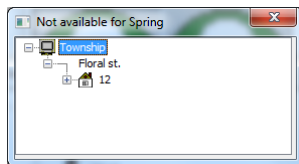
For user Chief:



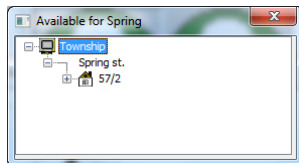
You can check availability of access of users to groups of lifts:



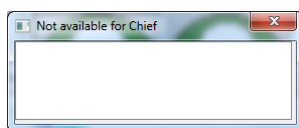
The following lifts are inaccessible to user Spring:



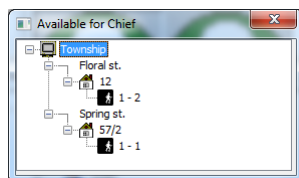
The following lifts are accessible to user Spring:



The following lifts are inaccessible to user Chief:



The following lifts are accessible to user Chief:



Access of a user to a group of lifts grants the user the right to view the status of lift only.

To grant to a user other possibilities you must definitely flag additional rights of this user. The following additional rights are available:

- 1) turn on LBS
- 2) control OUT1 output
- 3) control OUT2 output
- 4) lifts off
- 5) lifts on
- 6) service control device interaction LU with MCS to view settings
- 7) service control device interaction LU with MCS to change settings
- 8) service control device LU to view settings
- 9) service control device LU to change settings
- 10) view test parameters of the vocal tract and test results
- 11) enable/disable a test of the vocal tract and run the test
- 12) view the results of the last battery test
- 13) run battery test
- 14) view content of pages of LU firmware
- 15) change the state of the firmware pages
- 16) unload NVRAM
- 17) download NVRAM
- 18) view breakpoints in the time of the accident
- 19) listen to saved communication
- 20) clear errors logs fixed in the lift unit

Apart from the above rights, there are two complex rights:

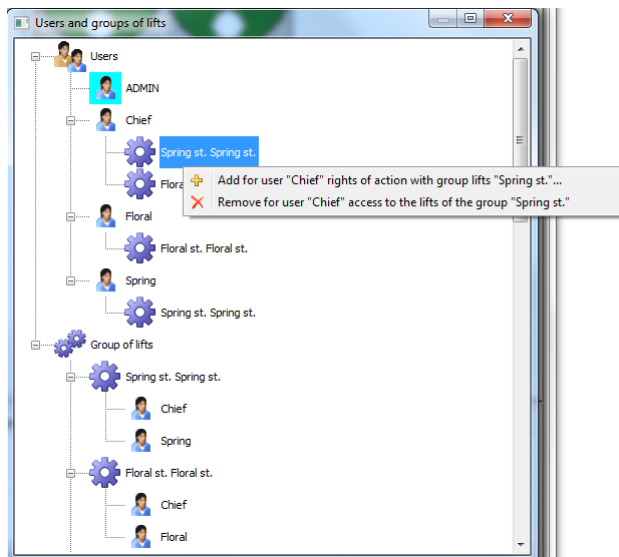
- 1) management;
- 2) setting.

The right of Management includes the following additional rights:

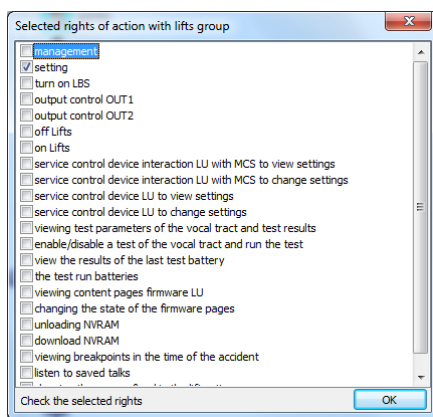
- 1) turn on LBS
- 2) control OUT1 output
- 3) control OUT2 output
- 4) lifts off
- 5) lifts on
- 6) service control device interaction LU with MCS to view settings
- 7) service control device LU to view settings
- 8) view test parameters of the vocal tract and test results
- 9) view results of the last battery test
- 10) view content pages of LU firmware
- 11) unload NVRAM
- 12) view breakpoints in the time of the accident
- 13) listen to saved communications
- 14) clear errors logs fixed in the lift unit

The right of Setting includes all additional rights.

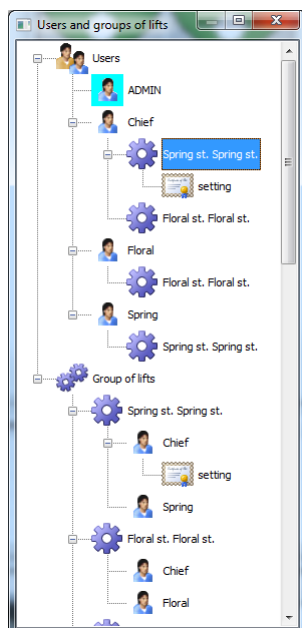
The rights can be assigned in the Users branch:



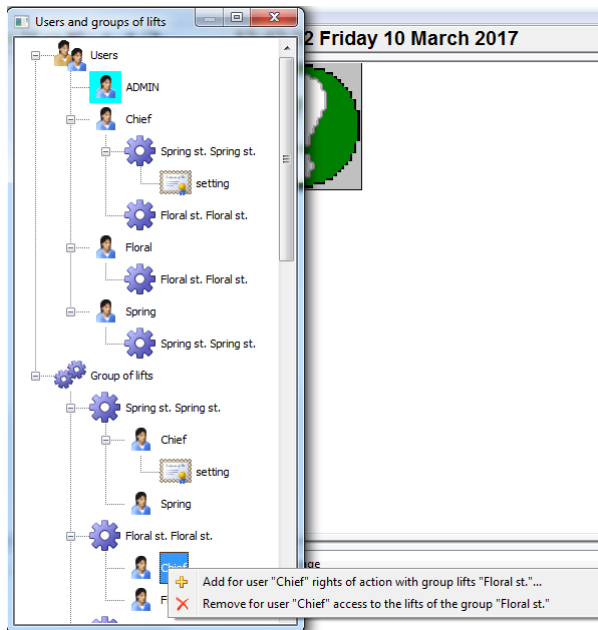
Next you must flag the rights to add:



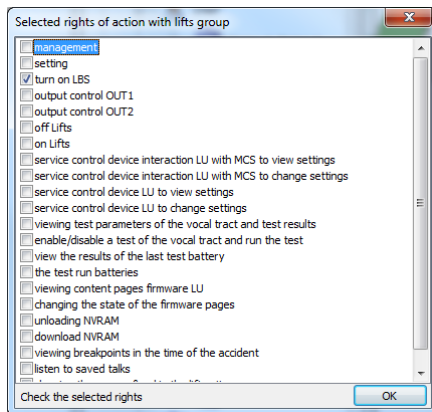
When you press "OK" all chosen rights will be indicated as follows:



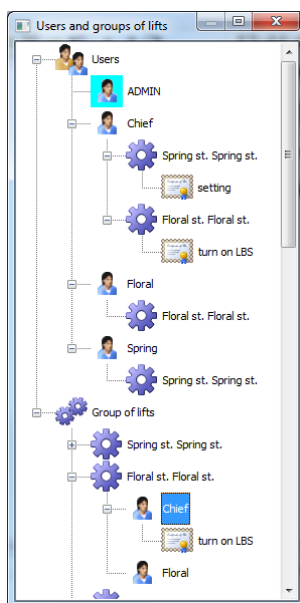
The rights can be added from the "Group of lifts" branch:



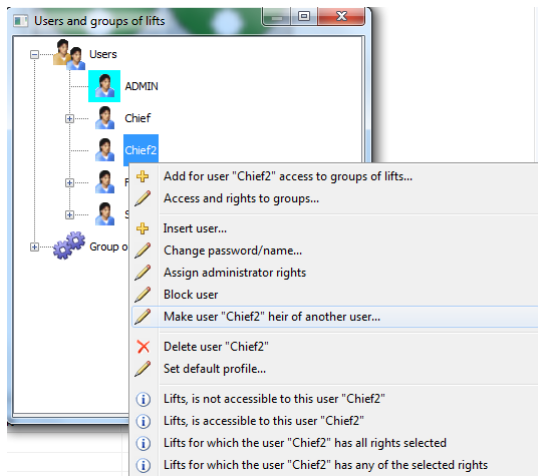
Next you must flag the rights to add:



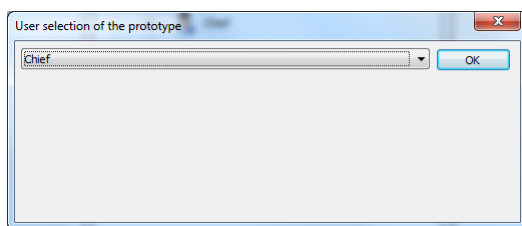
When you press "OK" all those rights will be indicated as follows:



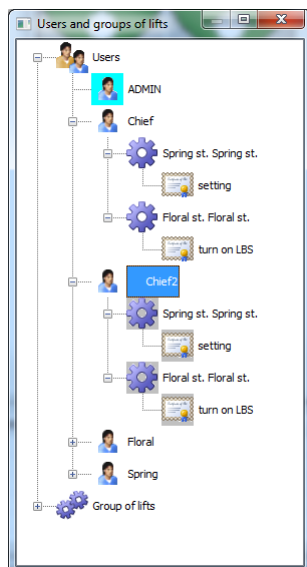
The system of access rights distribution does not use the notion of a group of users, i.e. of users having equal rights. Instead, the notion of "user-descendant" is used. Any user can be declared a descendant of another user (user-prototype). At that, all changes in the rights of user-prototype will be inherited by his descendants. Let us introduce Chief2:



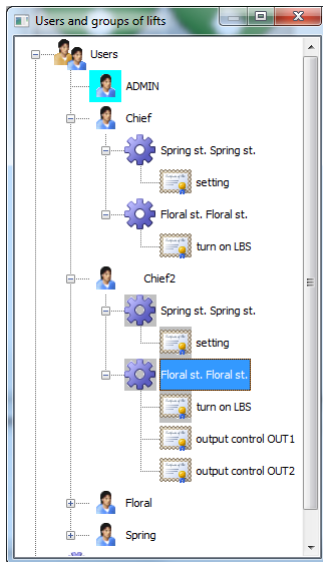
Now we make him a descendant of user Chief (user Chief must be registered and saved):



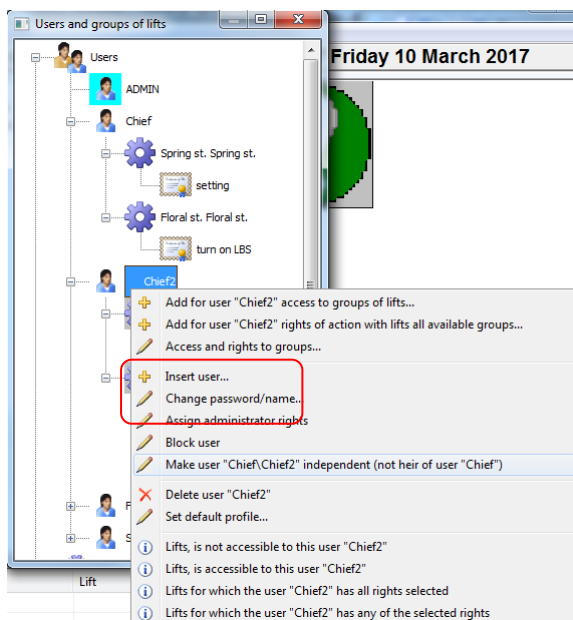
In the result we get:



Available groups and rights within these groups for user Chief2 in "Users and groups of lifts" have pictures on gray background as these rights have been inherited from user Chief. Inherited rights can not be deleted. A descendant can be granted additional rights; such rights will have pictures on white background:

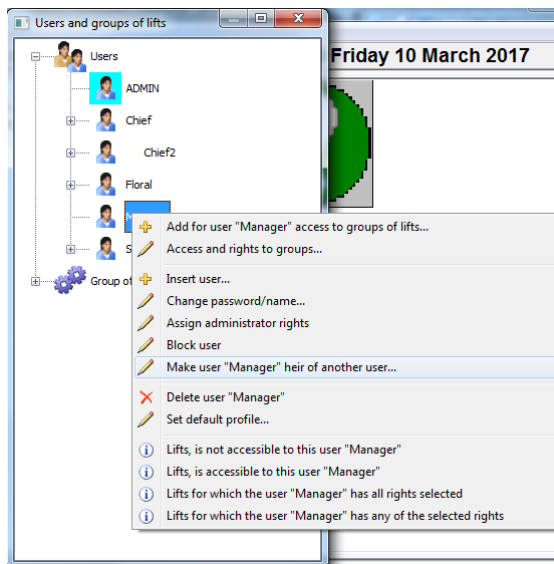


A user-descendant can be made an independent user:

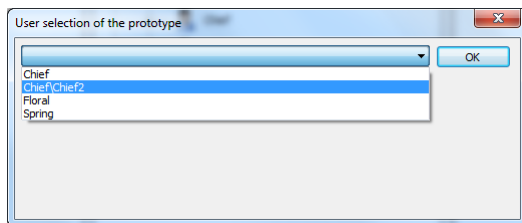


After that the user will have the rights of his former prototype and his own rights also; subsequent changes in the rights of the user-prototype will not affect the rights of the independent user.

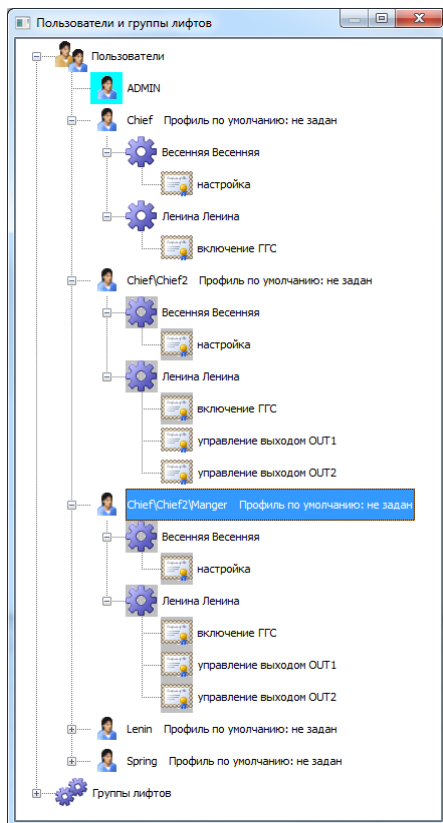
In his turn, the user-descendant can become a prototype for other users. Let us introduce user Manager:



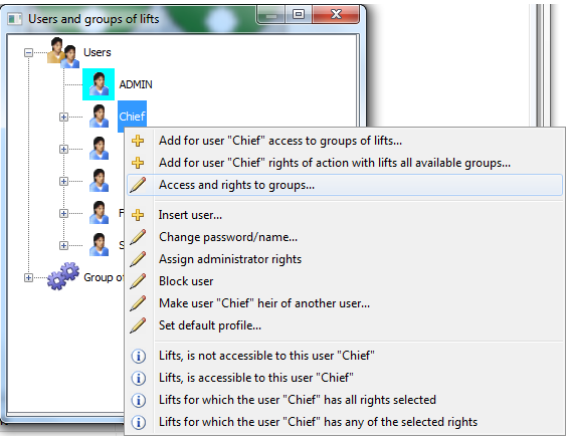
And we make him a descendant of user Chief2 (user Chief2 must be already registered and saved):



We get this:



Access and rights of users for all groups of lifts can be changed in the table format. To do it, choose "Access and right to groups ..." in the pop-up menu as we press the right mouse button (RMB) over the chosen user:

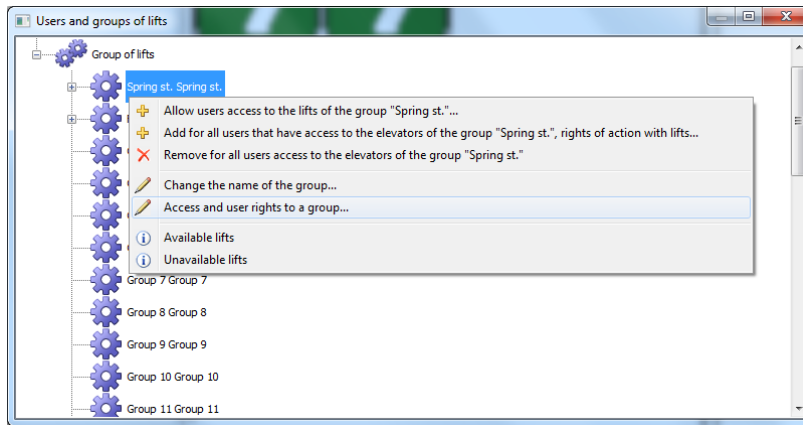


In the pop-up panel we can grant/reject access and rights to the chosen user to all groups of lifts. Access and rights are changed by pressing the left mouse button in the corresponding cell of the table:

The screenshot shows a window titled "Access and rights to lifts groups of user - Chief". It contains a table with the following columns: "Access/rights", "Spring st.", "Floral st.", and "Group". The table lists various access and rights for the user "Chief" across different lift groups.

| Access/rights | Spring st. | Floral st. | Group |
|---|------------|------------|-------|
| access | X | X | |
| management | | | |
| setting | X | | |
| turn on LBS | | X | |
| output control OUT1 | | | |
| output control OUT2 | | | |
| off Lifts | | | |
| on Lifts | | | |
| service control device interaction LU with MCS to view settings | | | |
| service control device interaction LU with MCS to change settings | | | |
| service control device LU to view settings | | | |
| service control device LU to change settings | | | |
| viewing test parameters of the vocal tract and test results | | | |
| enable/disable a test of the vocal tract and run the test | | | |
| view the results of the last test battery | | | |
| the test run batteries | | | |
| viewing content pages firmware LU | | | |
| changing the state of the firmware pages | | | |
| unloading NVRAM | | | |
| download NVRAM | | | |
| viewing breakpoints in the time of the accident | | | |
| listen to saved talks | | | |
| cleaning the errors, fixed in the lift unit | | | |

Access and rights of users for a particular group of lifts can be changed in the table format. To do it, choose "Access and right to a group ..." in the pop-up menu as we press the right mouse button (RMB) over the chosen user:

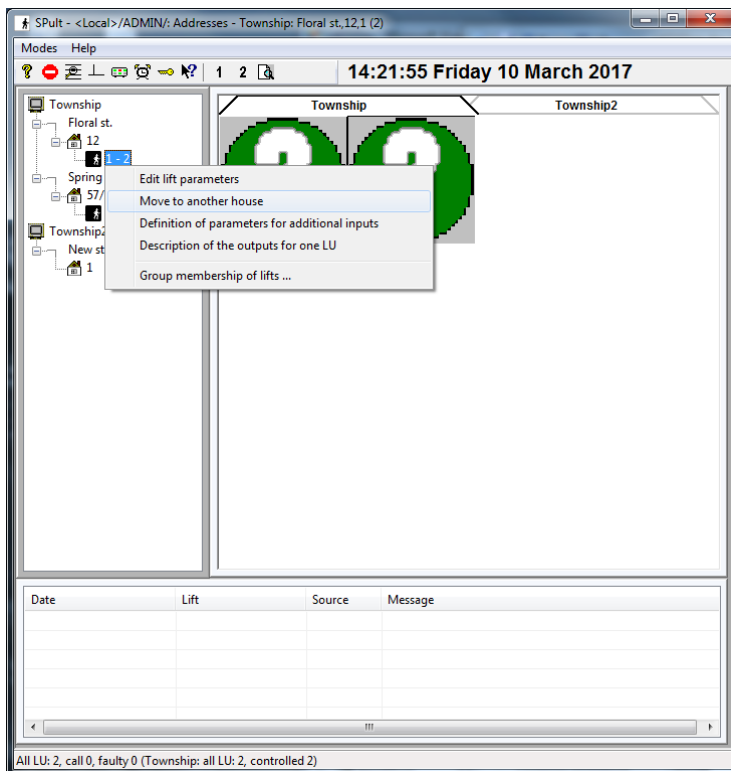


In the pop-up panel we can grant/reject access and rights to the chosen group of lifts to all users. Access and rights are changed by pressing the left mouse button in the corresponding cell of the table:

| Access and rights to lifts group of user - Spring st. | | | | | |
|---|-------|--------|---------|--------|--------|
| Access/rights | Chief | Floral | Manager | Spring | Chief2 |
| access | X | | X | X | X |
| management | | | | X | |
| setting | X | | X | | X |
| turn on LBS | | | | | |
| output control OUT1 | | | | | |
| output control OUT2 | | | | | |
| off Lifts | | | | | |
| on Lifts | | | | | |
| service control device interaction LU with MCS to view settings | | | | | |
| service control device interaction LU with MCS to change settings | | | | | |
| service control device LU to view settings | | | | | |
| service control device LU to change settings | | | | | |
| viewing test parameters of the vocal tract and test results | | | | | |
| enable/disable a test of the vocal tract and run the test | | | | | |
| view the results of the last test battery | | | | | |
| the test run batteries | | | | | |
| viewing content pages firmware LU | | | | | |
| changing the state of the firmware pages | | | | | |
| unloading NVRAM | | | | | |
| download NVRAM | | | | | |
| viewing breakpoints in the time of the accident | | | | | |
| listen to saved talks | | | | | |
| cleaning the errors, fixed in the lift unit | | | | | |

Moving lifts, houses and streets

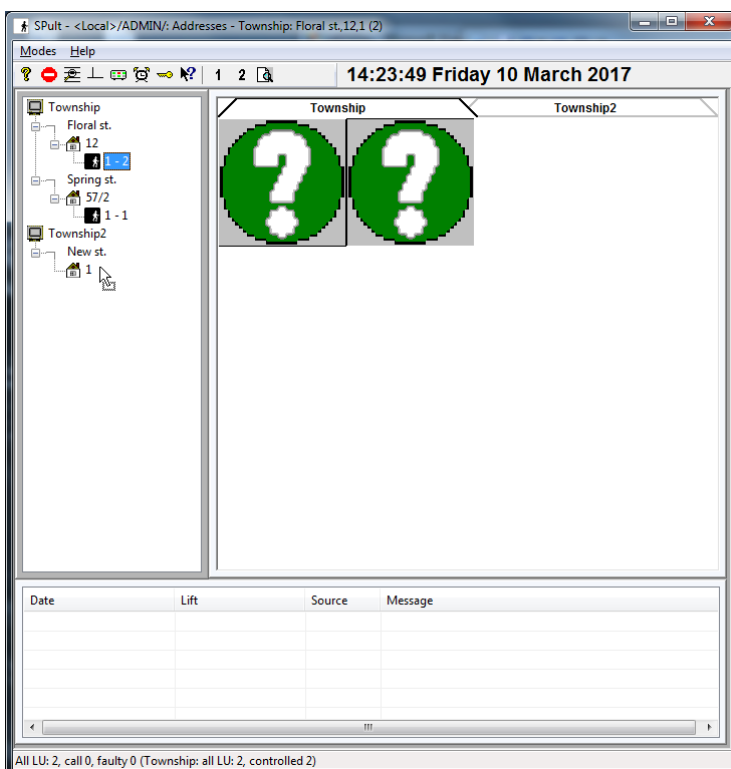
In the process of operation there may arise a need to modify the existing structure due to splitting or merging of control rooms. To move a lift from one house to another (belonging to the same or a different control room) press the right mouse button over the lift to be moved and choose "Move to another house":



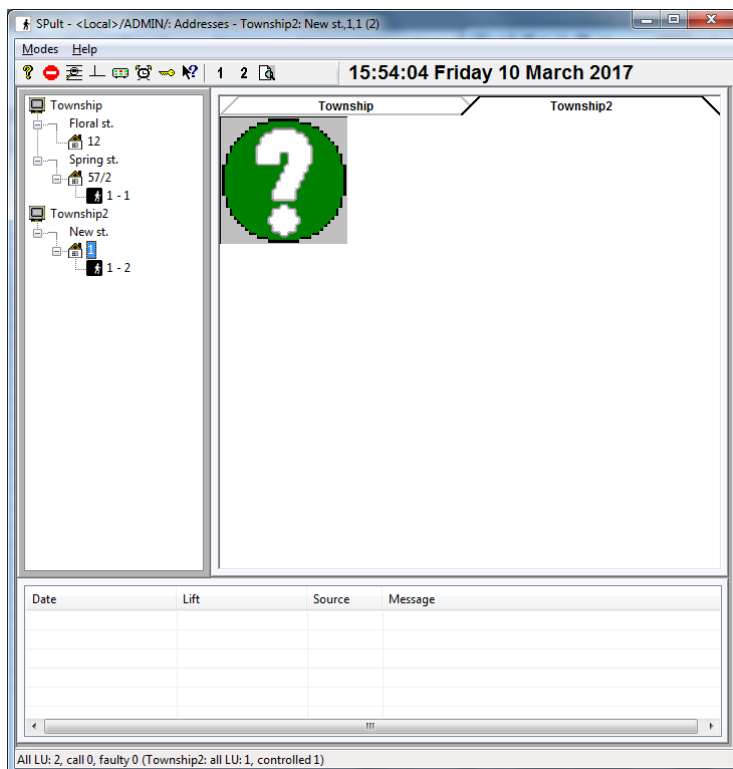
The mouse cursor will change to:



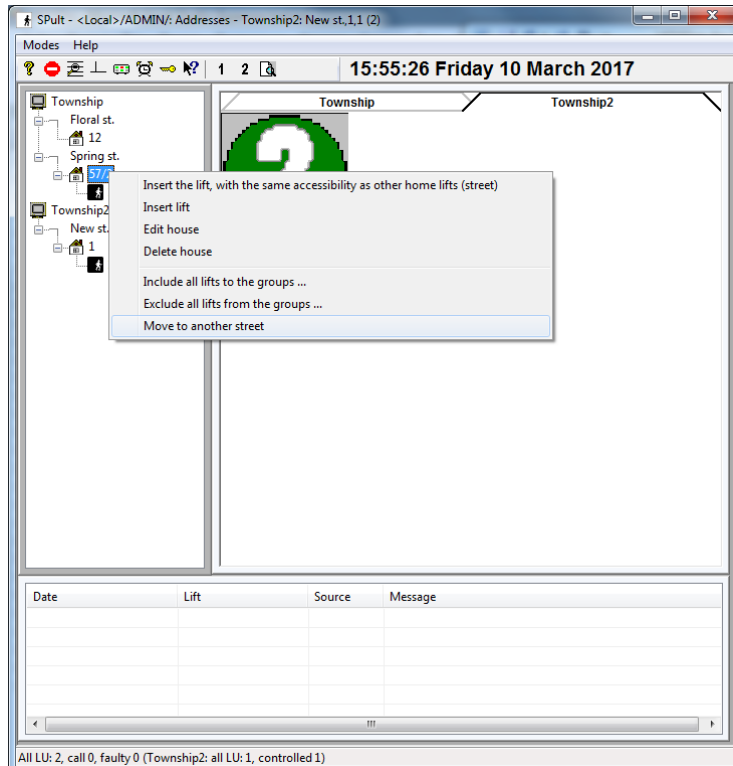
Drag the cursor to the house to move the lift to and press the left mouse button:



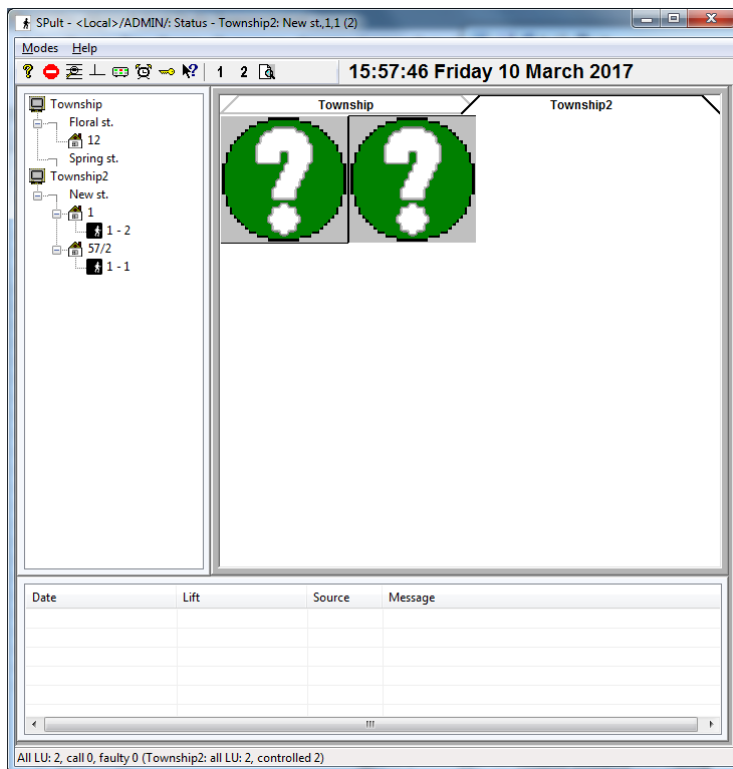
After confirmation the structure will look as follows:



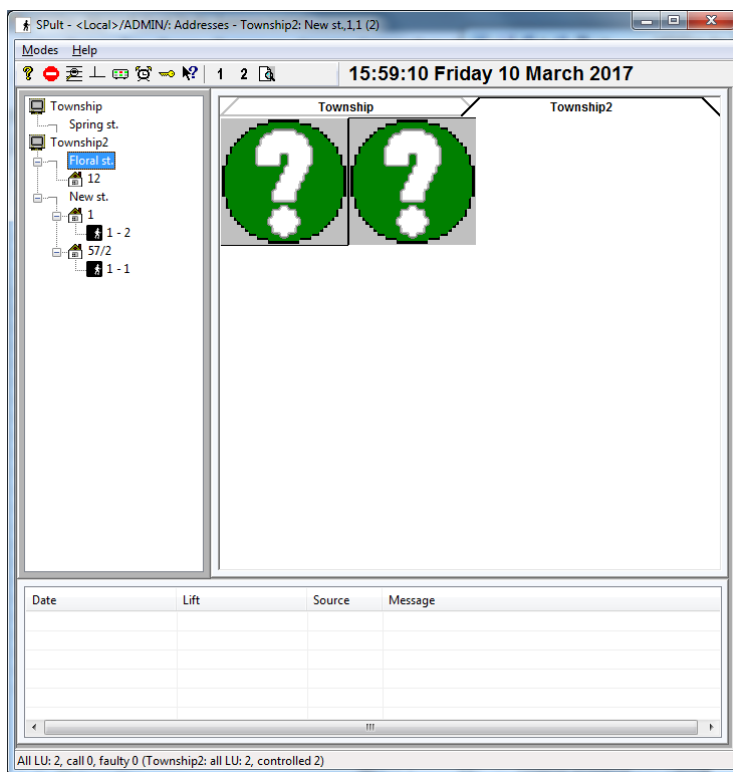
Moving a house from one street to another (belonging to the same or a different control room) is done in the similar way:



In the result of movement we will get the structure as follows:

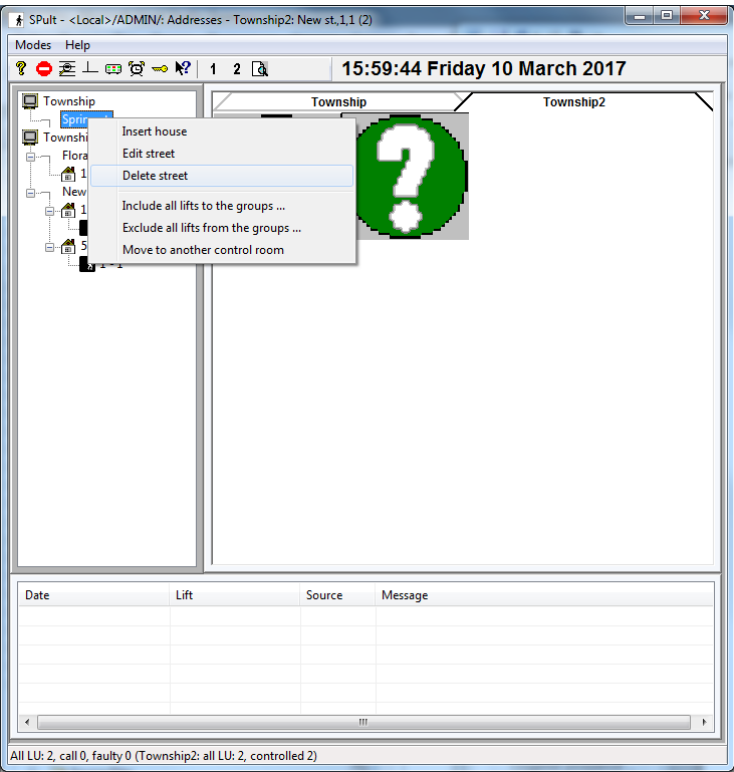


We can move a street:

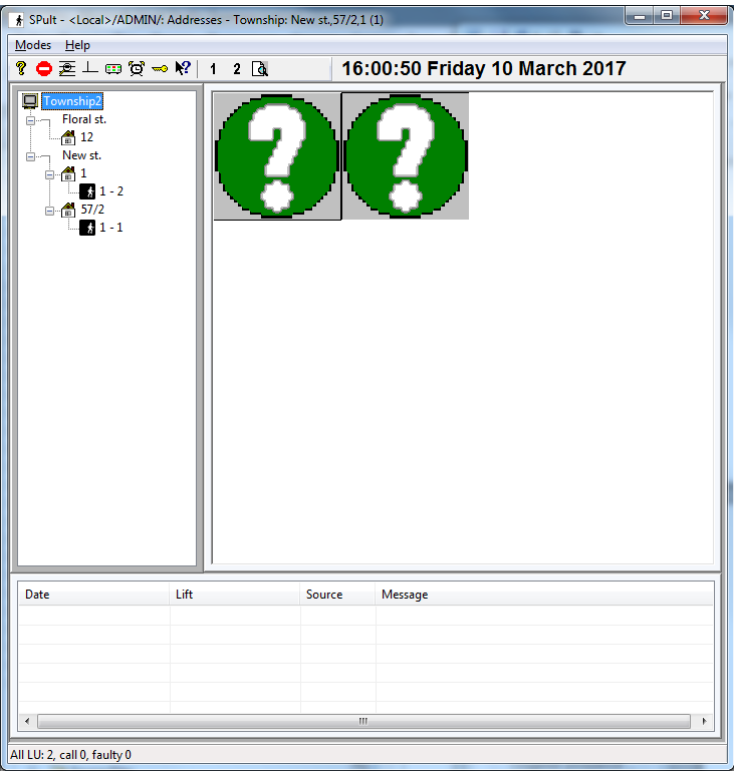


Removing houses, streets and dispatcher rooms

We can remove houses if there are no lifts in them (lifts can be moved to other houses); streets if there are no houses in them, or control rooms if there are no streets in them:

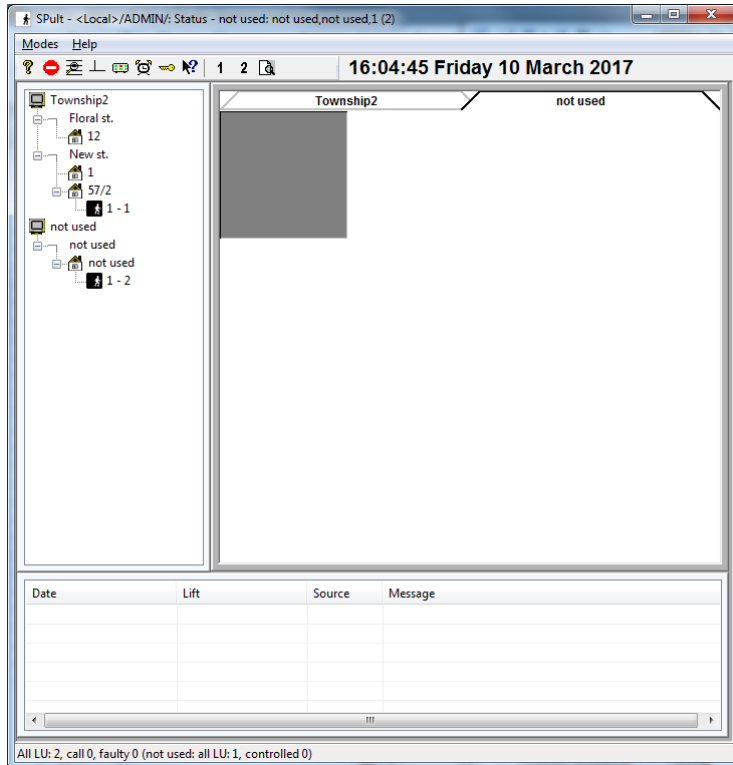


In the result of removal we get the structure as follows:

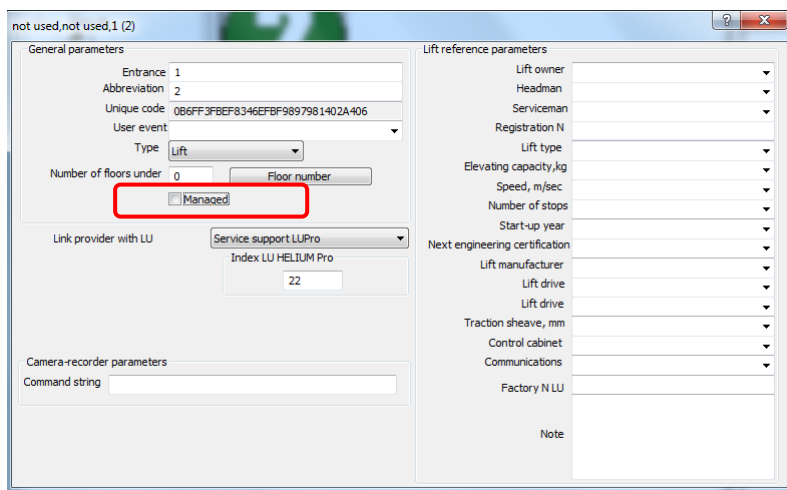


Not-used lifts

Lifts that have been entered during the current session of Administrator and not saved in the database can be deleted. Lifts that have been saved in the database can not be deleted. If you need to delete some previously saved lifts you can move them to a separate street (named "Not used", for example) or to a separate control room (again named "Not used", for example):



Besides, you can unflag the "Managed" attribute in the lift parameters and remove the lift from all accessible groups:



Later, when there is a need to introduce new lifts to the structure, you can use the "Not used" ones by moving them to the required house.

Operating SPult (regular users, not administrators)

Regular users (in our example called Spring, Floral and Chief) can operate SPult in two modes:

- 1) Operation mode
- 2) Settings mode.

The Operation mode is used to manage and monitor the status of available lifts and is actually similar to operator mode in MPultPro program.

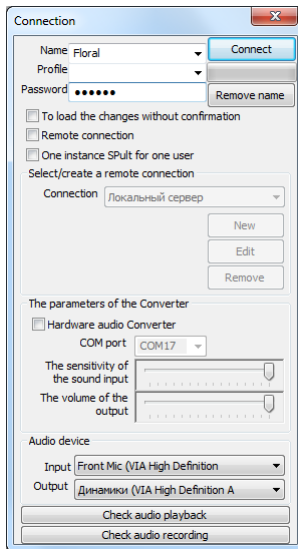
The Settings mode is used to fine-tune the software to suit a particular user and a computer:

- 1) size of the program window;
- 2) size and position of panels;
- 3) type of display in the status panel;
- 4) position of lift groups and lifts in groups;
- 5) characteristics of control unit:
 - a. "allow sound and blinking notification about new messages ";
 - b. "automatically switch on loudspeaker communication in control panel ".
- 6) General parameters:
 - a. duration of LSC being on;
 - b. duration of management dialogue with LU;
 - c. permission to power up lifts;
 - d. prohibition of operator to exit the program;
 - e. time the alarm clock is on;
 - f. automatic opening of not-viewed failures list;
 - g. automatic closing of not-viewed failures list;
 - h. prohibition of group sequential turning off the lifts;
 - i. prohibition to view the list of service keys;
 - j. type of lift identification in the log – as an abbreviated name of lift or a geographical address.

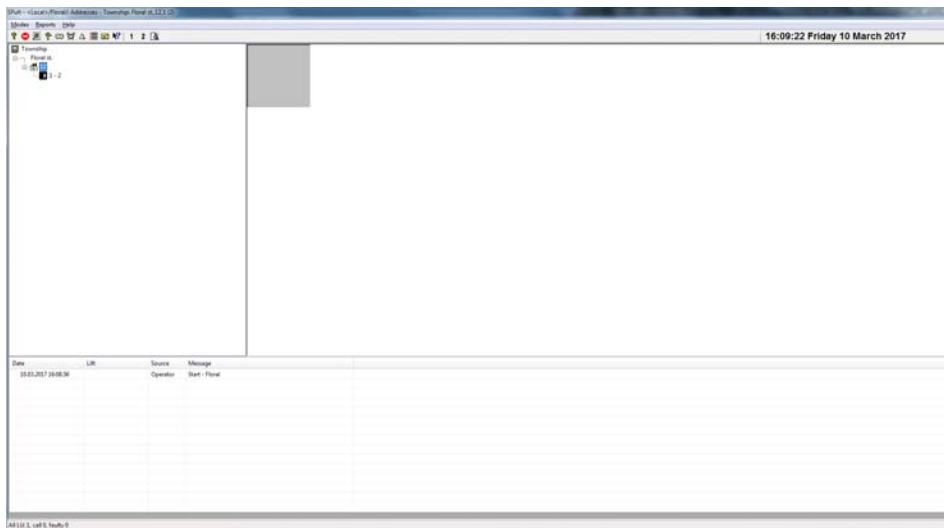
While lift access rights and the very structure are kept on the server, the appearance of the program window can not be kept in the server as it depends on the monitor and peculiarities of using SPult software on the computer, meaning the window appearance must be kept on the program on which the program is run.



MPultPro stores the window appearance data in the structure file, namely in MPultPro.XML. SPult will receive the structure from the server as it gets connected. In order to save the settings of SPult, the structure can be saved as a file on the computer that is being used to start SPult. The saved structure file has the following format: <user_name >.XML, for user Floral the file will be saved as Floral.XML.

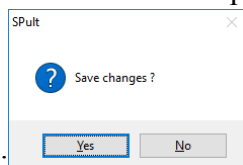
Let us start SPult as user Floral:




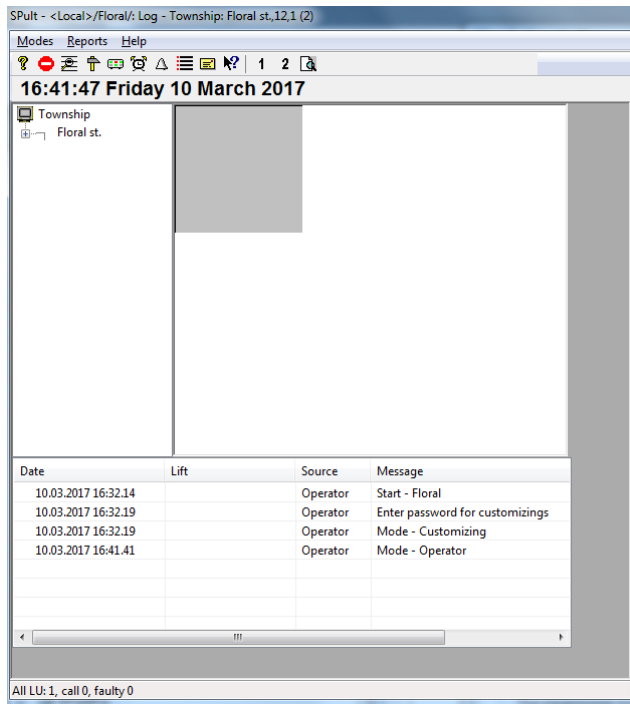
Upon connection SPult will switch to Operation mode:



To set up the appearance press  symbol in the tools panel or choose the executable item "Mode" \ "Switch to Customizing mode". When the password is entered, by default 123456, SPult will switch over to Settings mode. The panel borders get thicker and can be moved by mouse. Upon return to Operation mode, when you press  symbol in the tools panel or start as "Mode" \ "Switch to Operator mode", there will appear a request to save changes as



follows: ; when you confirm/press "Yes" the file Floral. XML will be changed (panel sizes, type of appearance and some additional parameters will be saved) and SPult will switch over to Operator mode:

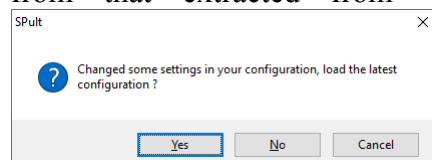
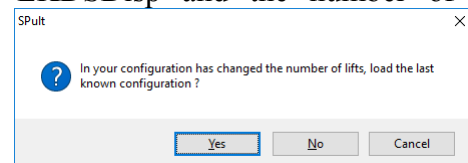


Let us view in details how SPult loads the structure from LKDSDisp server:

- 1) during first stage SPult queries the number of lifts and control sum of the structure for the user which was identified in the "Connections" panel.
- 2) Next SPult is searching for the file <user_name>.XML
- 3) If the file is not found SPult makes a query from LKDSDisp for the equipment structure and **becomes operational**.
- 4) If the file is found it is used to provide information on the number of lifts and the control sum which was queried during previous sessions and saved in <user_name>.XML.
- 5) If the number of lifts and the control sum received from LKDSDisp is equal to the number of lifts and the control sum extracted from <user_name>.XML, the structure is considered not having changed since the previous session of the current user. SPult will not query LKDSDisp for the structure but will load it from <user_name>.XML together with all additional settings as made in the Settings mode. Then SPult **starts working**.
- 7) If the number of lifts as received from LKDSDisp and the number of lifts in

<user_name>.XML differ, a query is made

number of lifts is the same but the control sum as received from LKDSDisp is different from that extracted from <user_name>.XML a query is made as follows



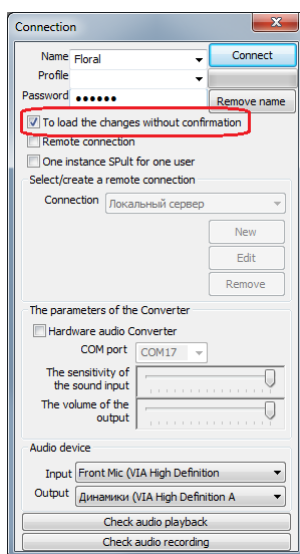
If "Cancel" is pressed then SPult **stops its operations**, if "No" is pressed SPult will load configuration from the file and **start working**. If "Yes" is pressed then configuration will be loaded from LKDSDisp, and next SPult will transfer the saved configuration to the downloaded configuration as follows:

- a. size of program window;

- b size and position of panels;
 - c type of display in the status panel;
 - d position of lift groups and lifts in groups;
 - e characteristics of control unit:
 - a. "allow sound and blinking notification about new messages ";
 - b. "automatically switch on loudspeaker communication in control panel ".
2. General parameters:
- a. duration of LSC being on;
 - b. duration of management dialogue with LU;
 - c. permission to power up lifts;
 - d. prohibition of operator to exit the program;
 - e. time the alarm clock is on;
 - f. automatic opening of not-viewed failures list;
 - g. automatic closing of not-viewed failures list;
 - h. prohibition of group sequential turning off the lifts;
 - i. prohibition to view the list of service keys;
 - j. type of lift identification in the log – as an abbreviated name of lift or a geographical address.

Next SPult **starts working**.

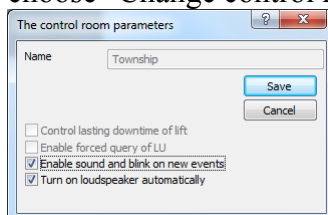
Queries for downloading the last configuration can be omitted if you flag the attribute "Load changes without confirmation" in the connection panel:



That is to say, some of the settings can be saved on the client's computer.

Let us deal in more details with settings that can be saved on the client's computer.

If you press the right mouse button over control room panel when in Settings mode and choose "Change control room" you will get another parameters panel:




Such parameters as "Control over lengthy idle time of lift" and "Allow forced query of lift" are not available for changing in the Settings mode as the corresponding actions are performed by the LDSDisp server, not by local SPult program. Such parameters as "Allow sound and blinking notification about new messages" and "Automatically switch on LSC in control panel" define behavior of SPult, can be changed and stored in configuration file.

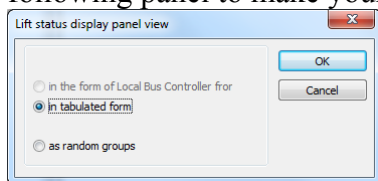
Parameter "Allow sound and blinking notification about new messages" defines how SPult will react to the new status of LU message issued by LDSDisp server. If the attribute is not flagged SPult will change the picture that reflects the lift status in the status panel. If this attribute is flagged then the picture will blink with sound signal. Indication of a new status by sound and blinking can be cancelled by flagging "Do not indicate new failures with sound and blinking" attribute of the group if the status panel shows lifts as groups.

Parameter "Automatically switch on LSC in control panel" defines behavior of SPult program when the operator opens the control panel of the lift that sent the call. If the parameter is flagged then voice communication will be switched on; if not, voice communication will not be switched on and the operator will have to press the voice communication button.

Lift units status panel can have three visual representations:

- 1) as front panel of LBC;
- 2) as a table;
- 3) as groups.

To change the type of representation press  in the tools panel and you will get the following panel to make your choice:



Representation in the form of LBC front panel and of a table does not require additional settings. Representation as groups requires inserting these groups into the panel and placing the lifts into groups. Groups can be defined in the Administrator mode and saved on LKDSDisp server. In this case all clients will receive description of groups in the structure. A particular client can modify description of the groups as he likes; in this case the groups description will be saved in the configuration file <user_name>.XML on the computer that started SPult. During subsequent starts of SPult, and when the control sum of the structure has not changed, the saved structure from the file will be used, and the changed groups description as well. If the control sum has been changed, i.e. the structure on the server has, then the information from changed structure file will also be used during start-up, in order to fully utilize the settings done on the client's computer.

Using profiles

As was mentioned earlier, when you use SPult program, apart from having information on status of available lifts, you also need design information, in particular:

- 1) size of the program window;
- 2) sizes and position of panels;
- 3) type of representation in the status panel;
- 4) representation of groups of lifts in the status panel and of lifts in groups.

Such additional design information depends not only on the user (on lifts available to the user) but also on the dimensions of the monitor of the computer that starts up SPult.

Let us call this additional information a Profile.

Previously we have described the case when a Profile has been created by a user and saved as a XML file. During initial connection of a user the server downloads to SPult the geographical structure of lifts locations (the addresses tree) and, possibly, the initial grouping of lifts in the status panel. In the Settings mode the user can change the size of SPult window, size of panels and of lift groups and the location of lifts in groups. After switching to Operator mode the whole structure with all modifications made by the User will be saved in a XML file of the following name format:

- <user_name>.XML – when connected to the server locally
- <remote_server>_<user_name>.XML – when connected remotely.

During subsequent connection of the user, if there are no changes in the information stored on the server then SPult will use data from the saved XML file. That is to say, secure storage and repeated usage of the profile of the current user on this particular computer is enabled.

The described approach has two major drawbacks:

1. One and the same user has to create a new profile on each computer even when the monitors/displays are identical. It is possible, though, to copy the XML files from one computer to another;
2. There may be problems when trying to merge the data in the saved XML file with the changed data received from the server.

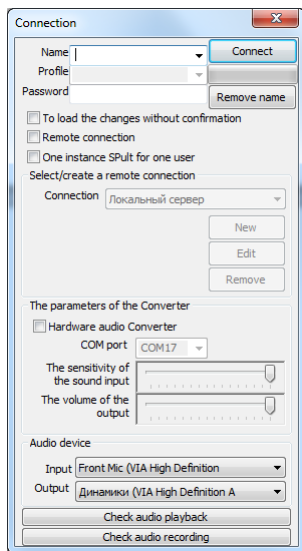
The second drawback is more substantial. A client may enter groups of lifts to the status panel, and the server also has groups in that same structure. If the structure on the server has been changed (like a new lift was added) then during downloading the new information from the server these groups of lifts (from the server) will be added to the status panel and change it dramatically. In order to avoid such overlapping, regular users are not allowed to introduce new groups of lifts. Such groups are introduced by an Administrator, and regular users can only change sizes, location of groups and positioning of lifts within groups. With such approach the XML file will still have the unique groups' identifier on the server. During merging the information on groups (sizes, location, lifts positioning) from the XML file will be transferred to the structure received from the server and a new XML file will be saved. With such approach the Administrator will have to create all groups in the status panel, and the users will have to adapt the groups for themselves. It looks feasible in territorially compact enterprises, but when the company that uses LMDS has many branches scattered around a larger territory the Administrator will not be able to take into account all desires of users, his job being to describe the equipment and to allocate rights.

When profiles are saved on the server users can adapt the display properties to suit themselves.

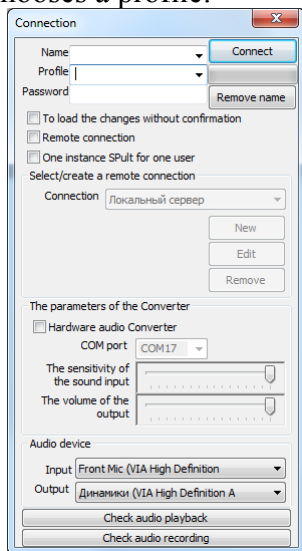
Profiles that are stored on the server can be of several types:

1. Personal – created by a user and available to this user;
2. Common – created by a user who is not a descendant of another user and available to all users-prototypes of the highest level (that is, not descendants)
3. Group – created by a user-prototype and available to all descendants of that user of all levels.

The profile that a user will use is identified in the connection panel of SPult application in the "Profile" field. During regular start-up of SPult the "Profile" field is accessible, i.e. you can not specify a profile:



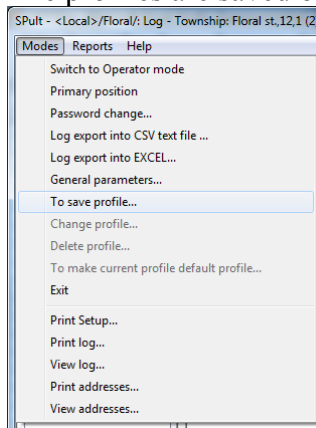
To activate the "Profile" field SPult must be started with key -p, and then you will enter/chooses a profile:



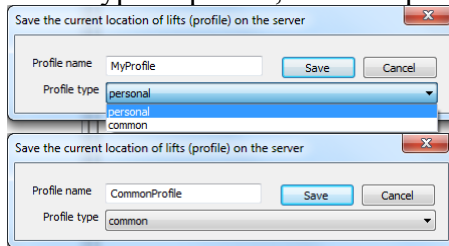
Profiles are set up by regular users, not administrators.

During initial connection to the server the user has no personal profiles, and immediately after installation of the software there are no common or group profiles, meaning that a user can enter the application without specifying the profile.

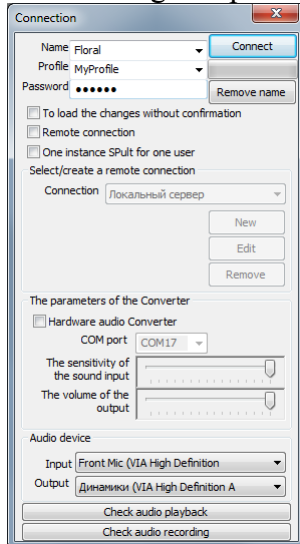
The profiles are saved on the server using the Settings mode:



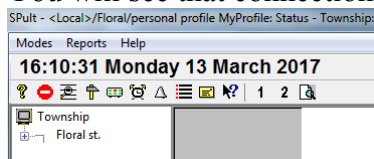
After choosing "To save profile..." you will get the pop-up window where you enter the name and the type of profile, for example:



After saving it is possible to get connected using the profiles:

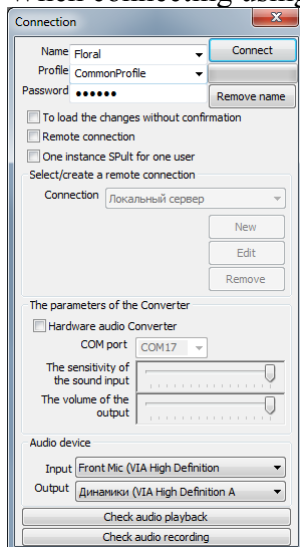


You will see that connection using profiles was enabled in the heading of SPult:

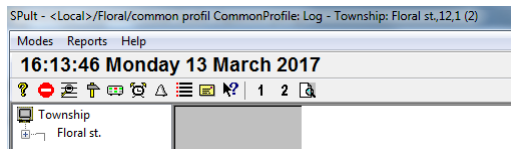


The heading will show the name of the profile ("MyProfile") and the type of the profile ("personal profile")

When connecting using common profile:



SPult heading will look like this:



If the name of the personal profile coincides with the name of the common profile, the personal profile will be used during connection.

The current structure (when connecting using a profile) will be stored in XML files, having the following names format:

- <user_name>_<profile_name>.XML – when connected to the server locally
- <remote_server>_<user_name>_<profile_name>.XML – when having remote connection.

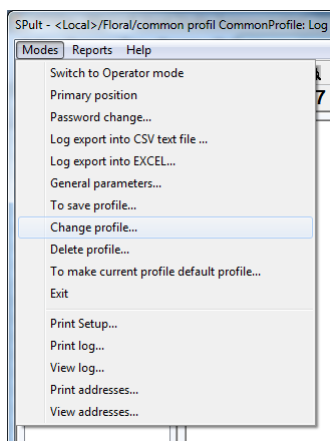
The following XML files will be created upon connection as described above:

- Local server _Chief_MyProfile.XML
- Local server _Chief_CommonProfile.XML

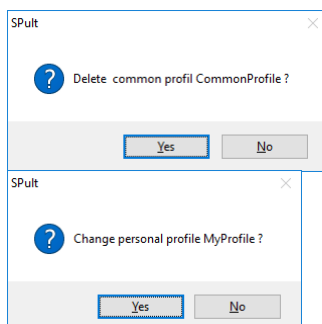
The structure is saved so that there is no need to download the data from the server anew if the structure has not changed.

When downloading changes from the server, behavior of SPult application will differ depending on whether a profile was used when connecting to the server. If no profile was used then SPult will behave normally, i.e. it will try to use additional design information from the saved XML file, if possible, in order to amend the structure received from the server. If a profile was used then the received structure will completely supersede the XML file.

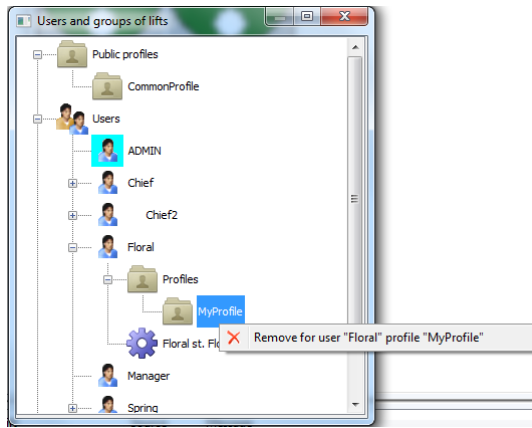
A profile can be changed or deleted by a user in the Settings mode:



The profile that was specified in the connection panel will be changed or deleted:



Profiles can be deleted in the Administrator mode:



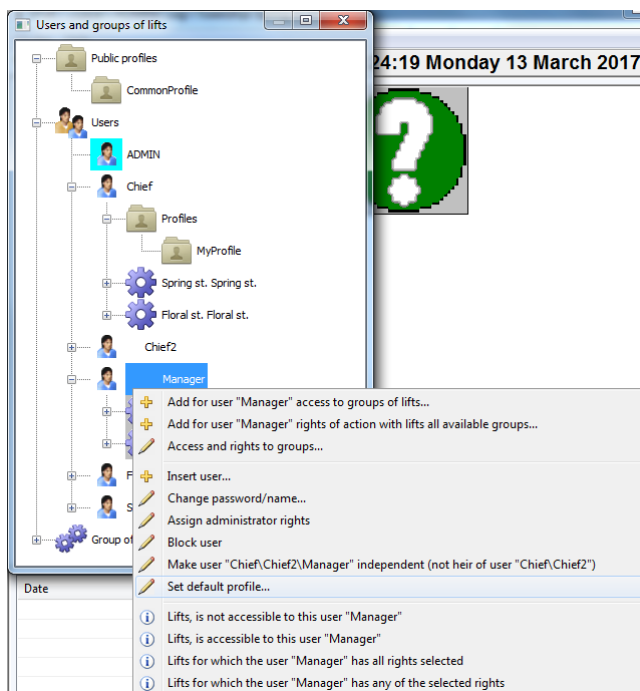
Connection under "CommonProfile" is available to users Chief, Floral and Spring as these users are not descendants of other users and common profiles are available to them. "MyProfile" is available to user "Chief" as a personal profile and to users "Chief2" and "Manager" as a group profile, as users "Chief2" and "Manager" are descendants of user "Chief".

When connecting using profiles of users who are not descendants, the search for a profile will start among common profiles, and then among personal profiles. If there is a common profile and a personal profile of the same name, the common profile will be used.

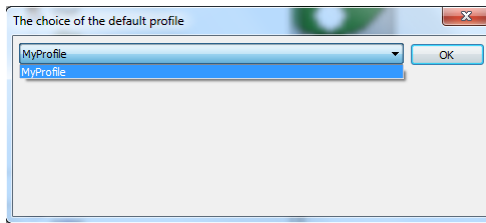
When connecting using profiles of users who are descendants, the search for a profile will start among personal profiles of a user-prototype of the highest hierarchy, then going down to lower hierarchy, and when the profile is not found among users-prototypes then the search will go to the profiles of user-descendant. That is to say, if user "Manager" connects up using a profile, the search for the profile will start with profiles of user "Chief", then of "Chief2", and then of "Manager".

A user can have a profile by default. Such default profile is assigned from among those available to the user and is used when no-profile connection is enabled.

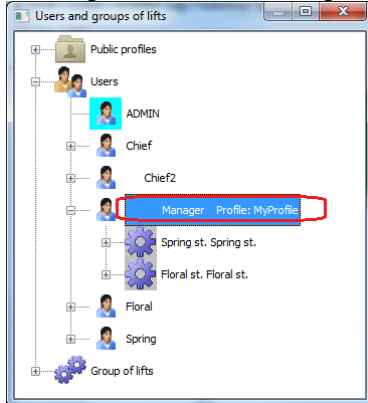
Only an Administrator can assign a default profile:



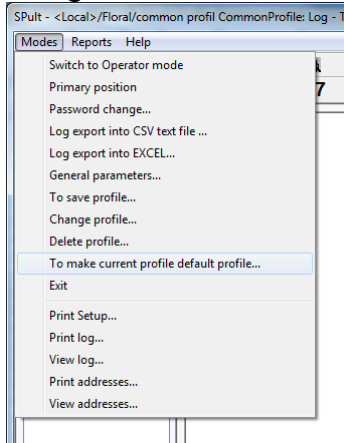
Selecting a profile is done from the following panel:



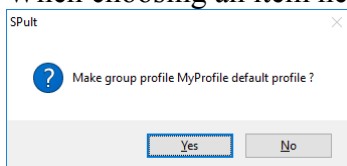
Having chosen a default profile, description of users will look like this:



A user can assign a default profile by himself. If the user connects up using a profile then the following menu will be available to him in the Settings mode:



When choosing an item here a confirmation will be requested:



After confirmation this profile will become the default profile.

Remote connection of SPult to LKDSDisp

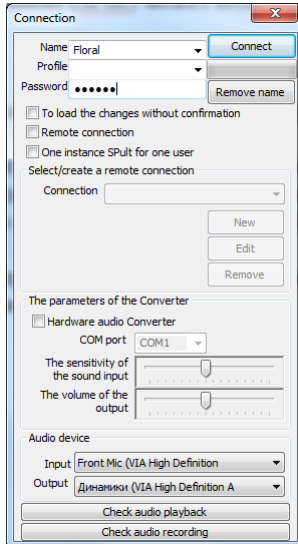
As was noted previously, a client (SPult) can connect to LKDSDisp server by two means:

- 1) Using DCOM protocol and
- 2) Using UDP protocol.

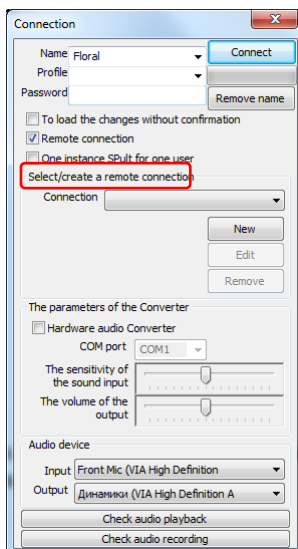
DCOM protocol is used when SPult and LKDSDisp are run on the same computer.

UDP protocol is used when SPult and LKDSDisp are run on different computers, accessible to each other via IP-network, though data exchange between SPult and LKDSDisp using UDP protocol is possible when SPult and LKDSDisp are run on the same computer, too.

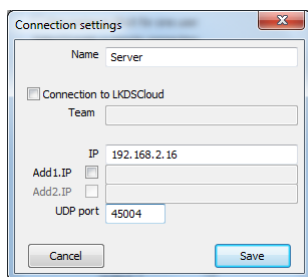
DCOM protocol will be used by SPult if "Remote connection" attribute is unflagged in the connection panel:



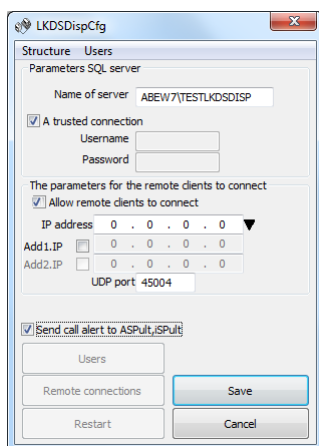
If "Remote connection" attribute is flagged then some more fields become available in the group "Select/create a remote connection":



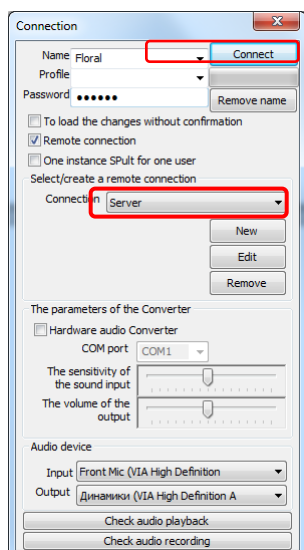
Prior to connection you must enter a description for the remote server: press "New" and enter connection parameters:



Enter IP-address of the computer where LKDSDisp server is started in the corresponding field; "UDP port" means the UDP-port number to be used when sending data to the server. This UDP-port number must coincide with the UDP-port number entered in LKDSDispCfg configurator:



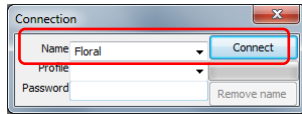
After saving the remote server parameters and choosing it in the pop-up "Connection" list you can actually connect up by pressing "Connect":



When connected, SPult can not operate in the Administrator mode even when having Administrator rights. In case of remote connection the saved structure file will have the following format: <Remote server ><user_name>.XML. For user Floral, when connected remotely to "Server", the file will have the name of Server_Floral.XML.

Operating SPult with simplified connection panel

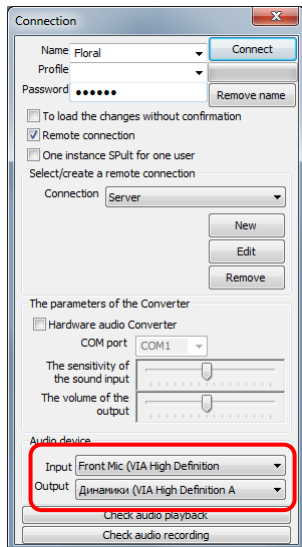
When starting SPult with key `-s`, e.g. `SPult.exe -s`, then the connection panel will look like this:



This option will hide connection details.

Using various sound devices for communication and failure indication

If the computer has two or more sound devices (two soundcards), you can configure SPult to use the Windows-default sound device for errors indication, and the other sound device will be used for operator communication using headphones. You can specify the output device for communication in the connection panel:



You can also specify the sound input used for dispatcher communication and test the chosen devices.

Remote connection via smart-phone applications

Apart from SPult, there are applications for smart-phones working under Android, Windows Phone and iOS.

Android OS

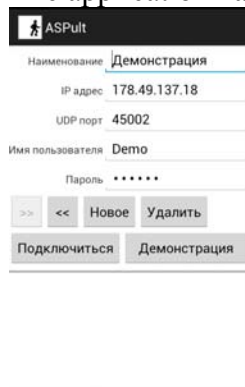
ASPult application for Android-based smart-phones is available on Google Play.

You can find the application using the manufacturer's name:

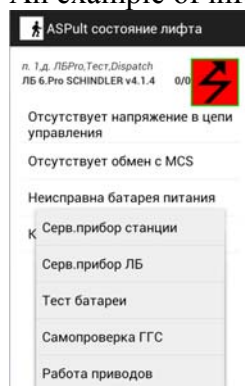
LIFT-COMPLEX DS

Or by the name of the application: ASPult.

The application has a connection panel; "Demo" will allow connecting to a demo server:



An example of info panel with lift status:



Windows Phone 8.1, Windows 8.1, Windows 10 OSs

The universal application FSPult is designed to work under Windows Phone 8.1 and Windows 8.1, and can be found in Windows Phone Shop and Windows Shop. The application allows viewing lift status, voice communication with lift car and control room. The application works on any computers under Windows 8.1 (smart-phones, tablets, notebooks and desktops).

You can find the application using its name: FSPult, or under the company name of LIFT-COMPLEX DS.

The application has a connection page and you can run Demo to be connected to a demo server:

FSPult подключение

Наименование: Демонстрация

IP адрес: demo.lkds.ru

UDP порт: 45002

Пользователь: FSPult

Пароль:

☐ Озвучивать вызов

Подключиться >> <<

Новое подключение Удалить подключение

o FSPult Демонстрация

An example of geographical structure page:

Все диспетчерские 1/454/1836

Dispatch 1/1/2

Кутателадзе(200) 0/12/360

Кутателадзе(201) 0/68/367

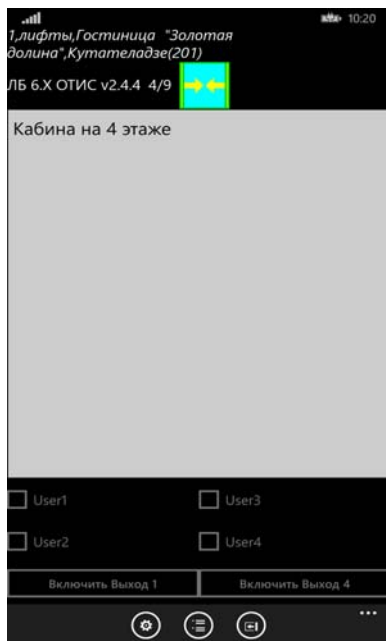
Маяковского, 17 0/0/178

Октябрьский 0/215/274

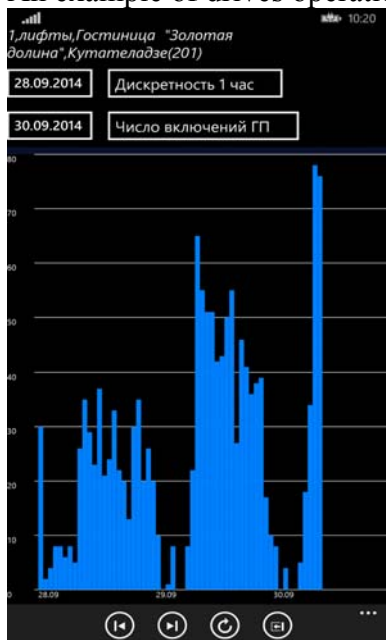
г. Бердск 0/76/271

ул. 1905года 0/82/384

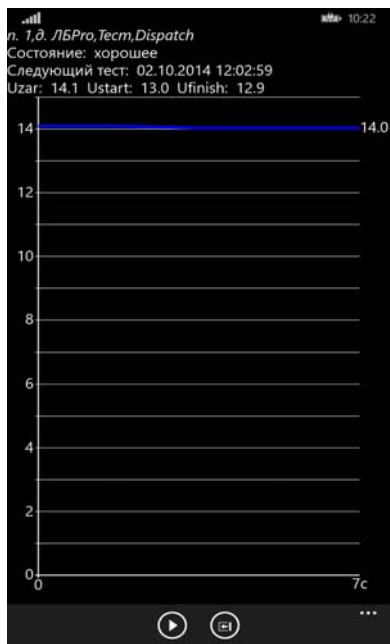
An example of lift status page:



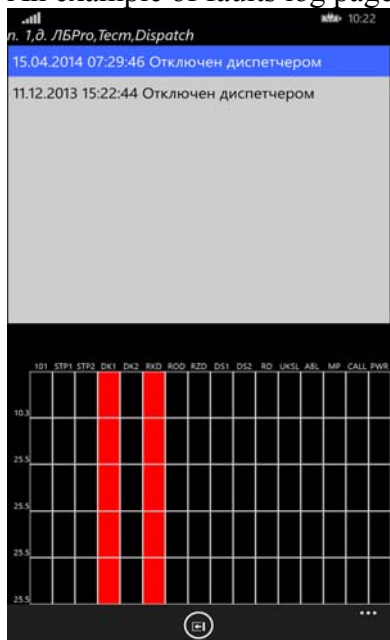
An example of drives operation statistics page:



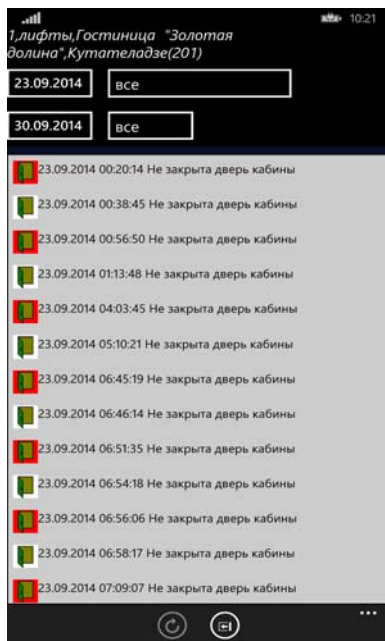
An example of battery status page:



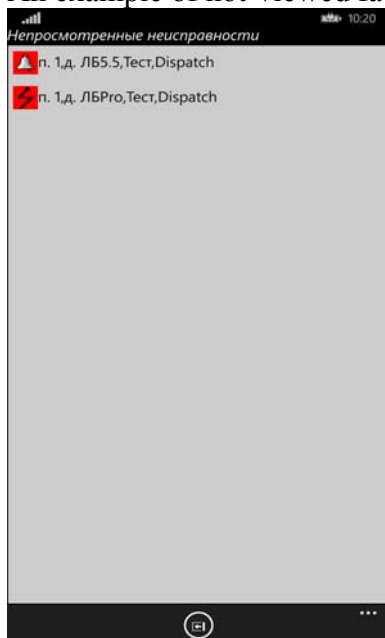
An example of faults log page:



An example of log page:



An example of not-viewed faults page:



IOS.

The iSPult application works under iOS, can be found in App Store and can operated on iPhones and iPads.

This application can be found using its name: iSPult.

The application has a connection panel and you can press "LKDS Parameters" to connect to a demo server:

Carrier 1:27 PM

Подключение

| | |
|--------------|--------------|
| Наименование | Сервер LKDS |
| IP адрес | demo.lkds.ru |
| UDP порт | 45002 |
| Пользователь | iSPult |
| Пароль | |

[Подключиться](#) Новое подключение

>> << Удалить подключение

[o iSPult](#) [Параметры LKDS](#)

An example of geographical structure page:

Carrier 1:32 PM

< Подкл Все

Dispatch 1/0/2

Кутателадзе(200) 0/0/360

Кутателадзе(201) 0/18/367

Маяковского, 17 0/0/178

Октябрьский 0/0/274

г. Бердск 0/0/271

ул. 1905года 0/0/384

An example of lift status page:

Carrier 1:34 PM

< д.17 п.1

ЛБ 6.0 KONE v2.3.0 6/6

Главный привод включен
Кабина в движении

User1 User3

User2 User4

Включить Выход 1 Включить Выход 4

An example of drives operation statistics page:

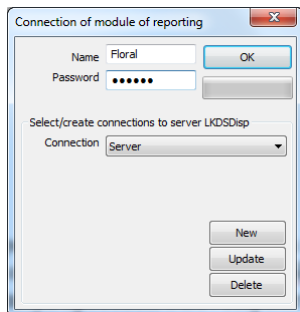


Obtaining reports

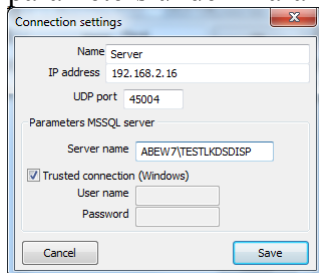
Reports are produced by SReport.exe module. Such reports are similar to the ones generated by MPultPro. The module can be found here: \LKDSProEN\SPult\.

The reporting module connects up to LKDSDisp server for authorization, i.e. confirmation of access rights, and to SQL server immediately to obtain data from the database.

Upon start of SReport the following connection panel will pop up, looking similar to connection panel of SPult:

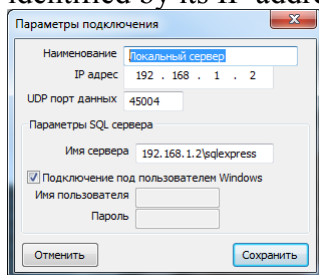


User name is verified on LKDSDisp server chosen from the drop-down list of "Connections". The connections list is similar to that of SPult. SReport always connect to LKDSDisp remotely, i.e. using UDP protocol. SQL server parameters are set in connection parameters under "Parameters MSSQL server".



The name of SQL server contains the name (address) of the computer where the SQL server is run and, possibly, the name of SQL server version. In the above example the computer's

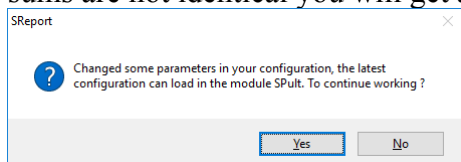
name is abew7, name of SQL server version is sqlexpress. In the example below the computer is identified by its IP-address 192.168.1.2:



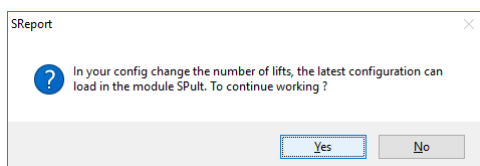
When "Connection as Windows user" attribute is flagged the SReport module will be authorized by SQL server as a Windows user who initiated SReport. If "Connection as a Windows user" is not flagged you will have to enter "User name" and "Password" parameters of the SQL server user to be used by SReport as authorization with SQL server. The SQL server user must have the rights to 'read' tables of LKDSDISP database.

You can check accessibility to SQL server with these parameters with the help of "Microsoft SQL Server Management Studio Express". In the panel "Connection to server " that will appear when you start " Microsoft SQL Server Management Studio Express" you must enter parameters of the group "SQL server parameters". If connection is enabled and LKDSDISP database tables are available, then SReport module will have access to the database.

In case of successful authorization with LKDSDisp server SReport module will make a query to LKDSDisp concerning configuration parameters: number of available lifts and control sum, after which it will search the current folder for a configuration file: <Server_name_LKDSDisp>_<user_name>.XML. An example of configuration file: Local server_Floral.XML. If no configuration file is found SReport will request configuration from the server and saved it in a file. If the configuration file has been found then the number of available lifts and the control sum of it are checked against those received from the server. If the control sums are not identical you will get a message:

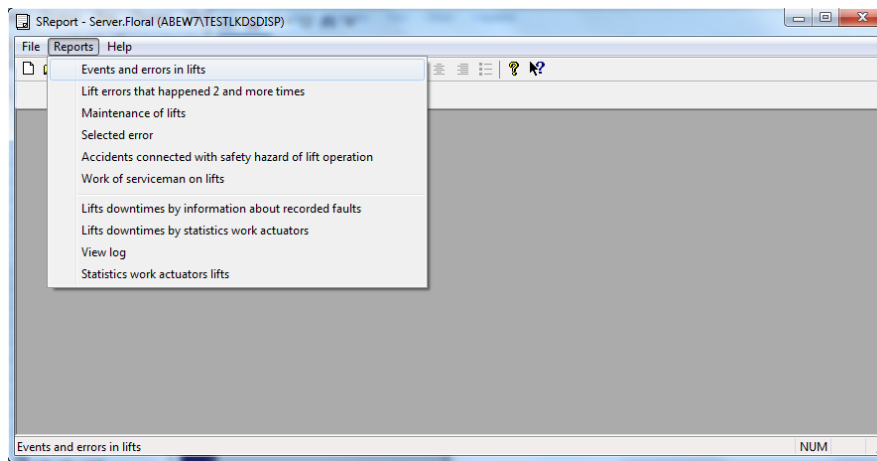


If the numbers of available lifts are not identical the following message will be displayed:

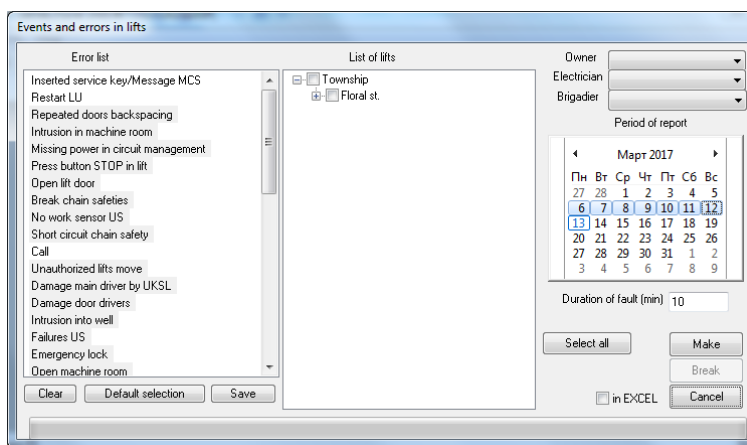


To synchronize the configuration file with the configuration provided by LKDSDisp, start SPult under the same user in the remote connection mode. If no synchronization is required, press "Yes".

When successfully connected to SQL server, main window of SReport will open:

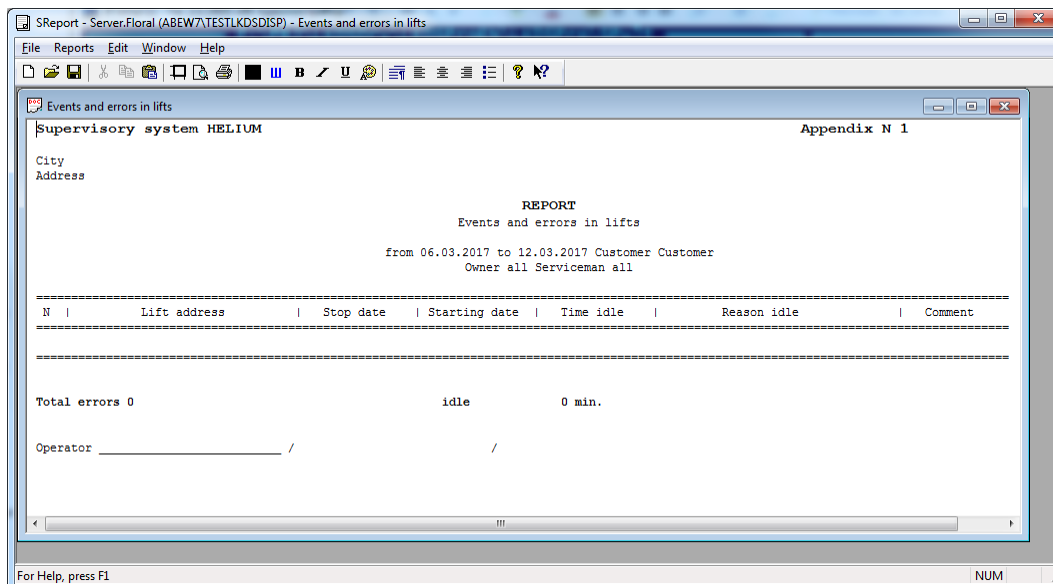


Queries for parameters and algorithms of reporting are the same as used in MPultPro, for example:



Report-making can be aborted by pressing "Break".

The finished report will be placed to a separate window inside the main window of SReport module:



Database backup, database recovery, transfer of database to another PC

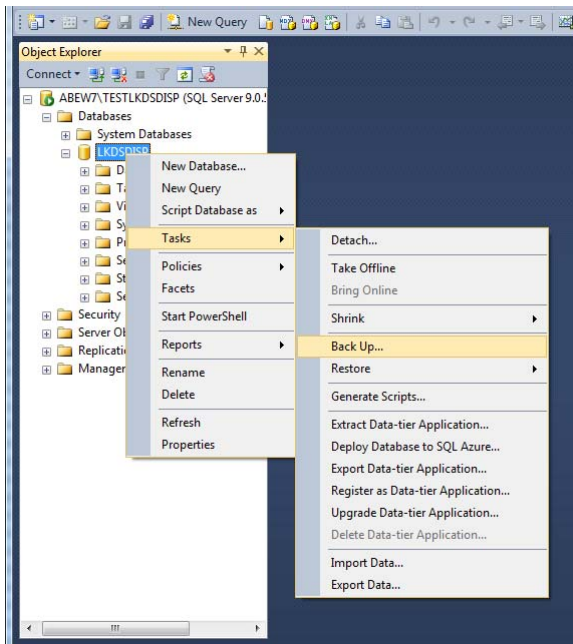
As was noted above, all data is stored in LKDSDISP database. In the process of operation there may arise the need to backup the database. Such backup copy will be needed when:

- 1) A crashed database must be restored on an operational computer;
- 2) Software must be transferred to a different computer;
- 3) Data must be transferred to a different computer to make reports and analyze data.

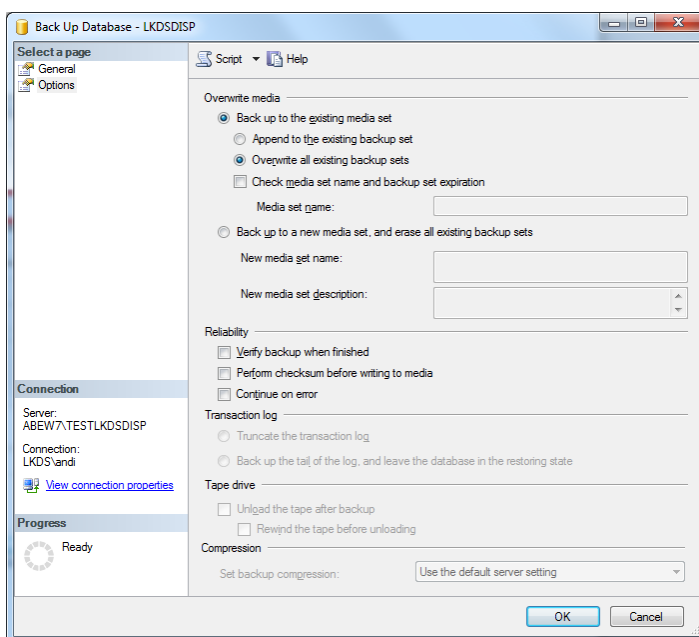
Below, the process of making a database backup and the database recovery process using a backup in "SQL Server Management Studio Express" are described.

Making database backup

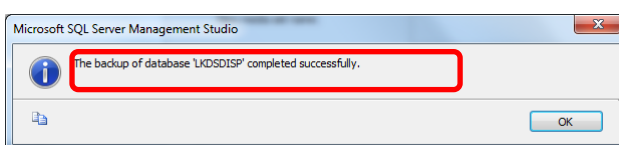
Press right mouse button when in LKDSDISP database and choose "Tasks\" "Back Up ...":



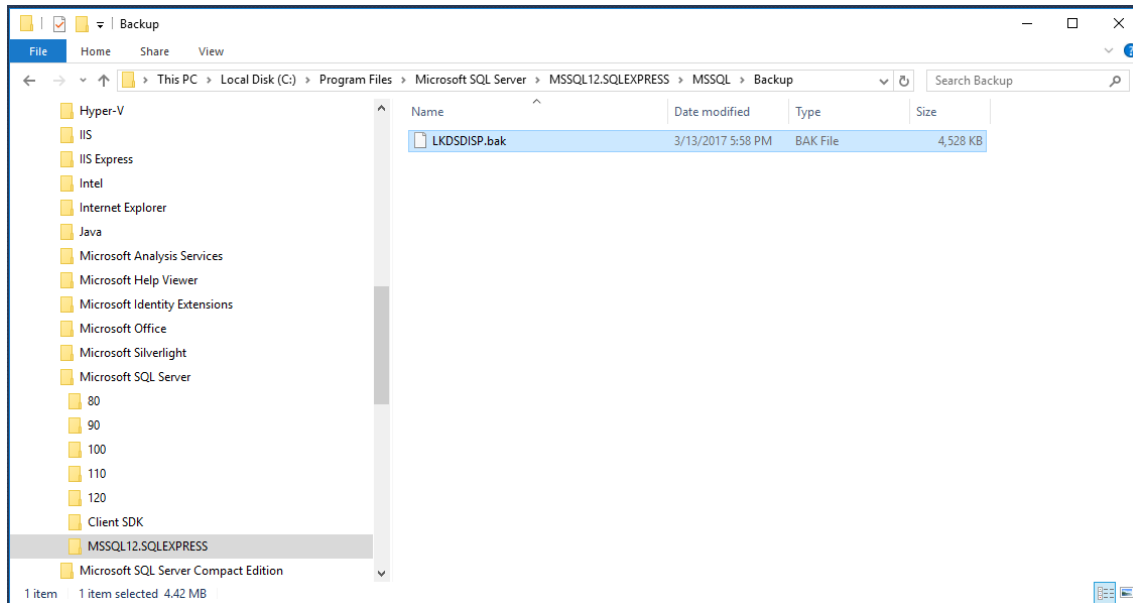
In the next window go to "Parameters" and choose "Overwrite all existing backup sets.":



Press OK. When successful, the following message will appear:



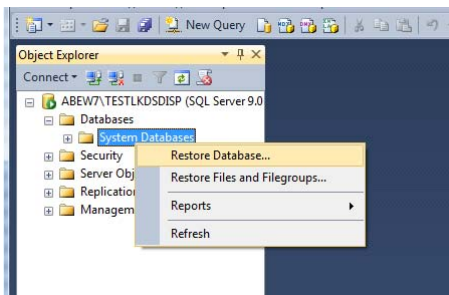
And the following file will be created:



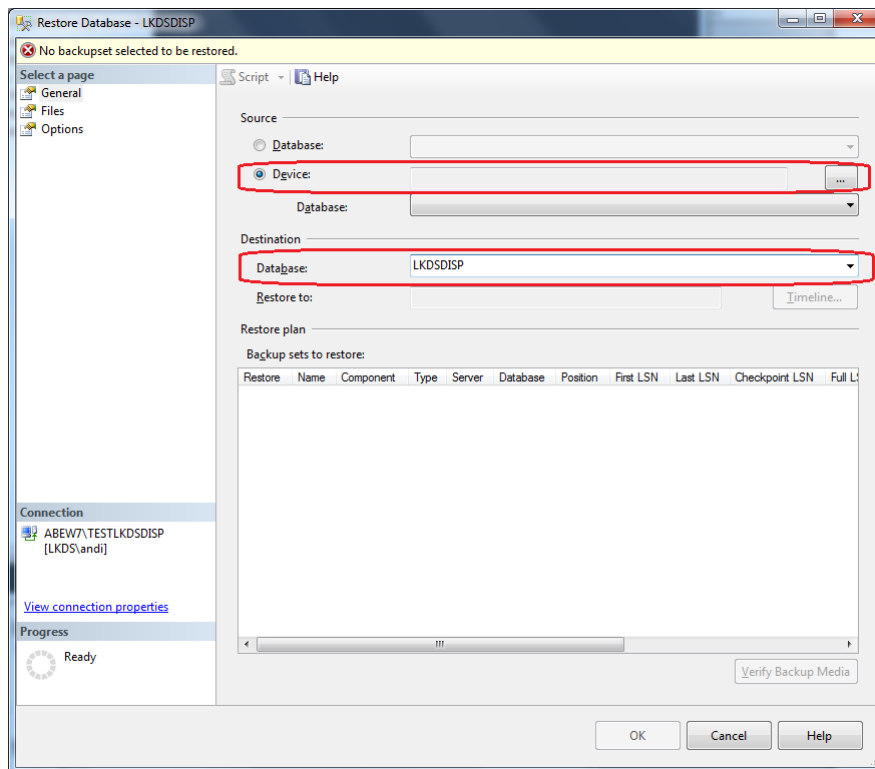
LKDS DISP.bak is the backup database copy.

Database recovery using database backup

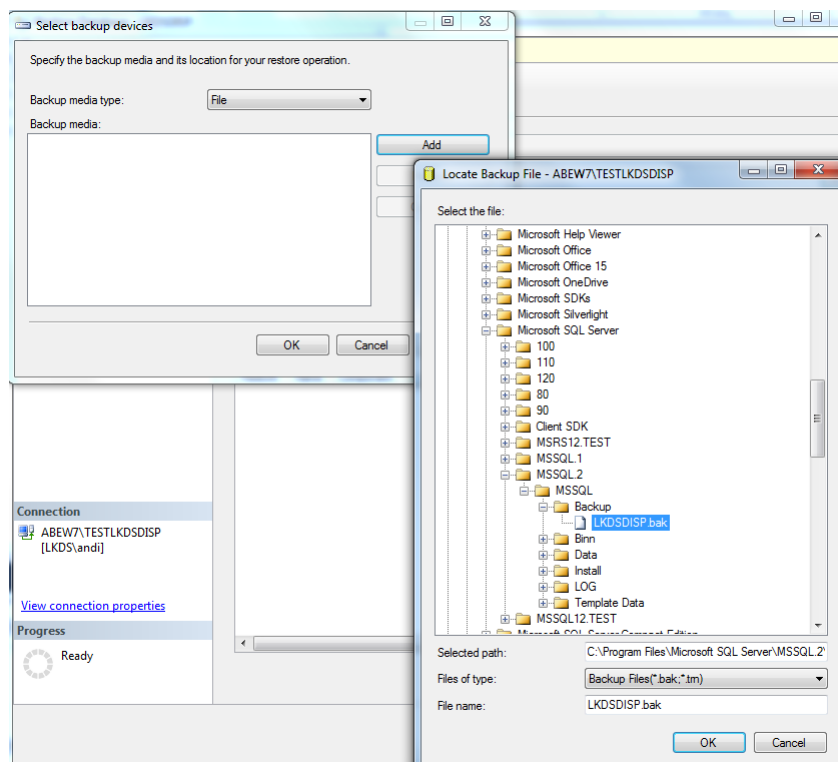
Choose "Restore Database...":



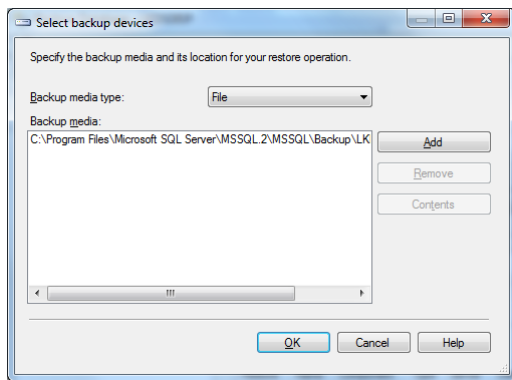
In the field "Database" of "Destination" enter LKDS DISP, in "Source" choose "Device" and press "...":



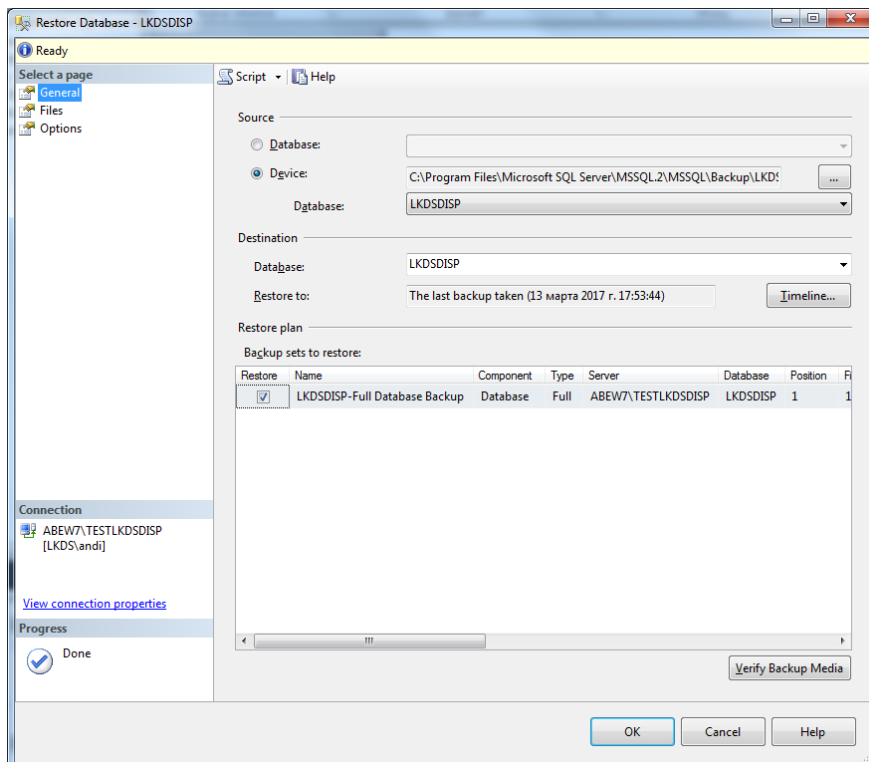
In the new window press "Add" and choose LKSDISP.bak which is the backup database copy:



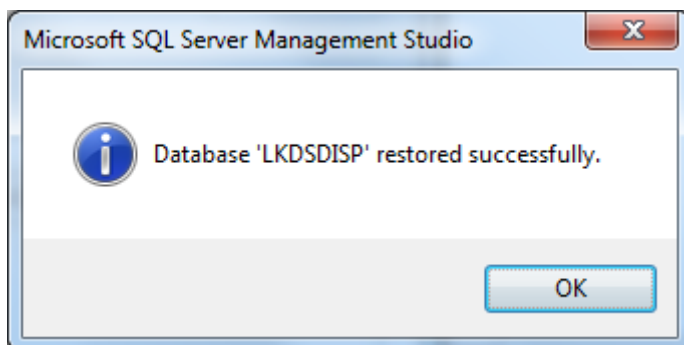
Press "OK":



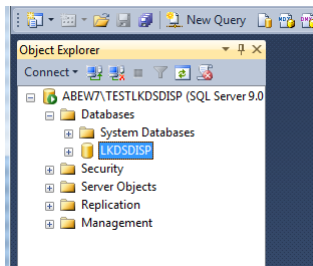
Press "OK"



When successful, the following message will pop up:



And the recovered database:



The backup process can be made automatic by means of MSSQL server. You can configure autosave, e.g. at night, in between queries for drives operation statistics.

Software failures analysis

In order to pinpoint faults in operation, program modules can log their activities in text files. Such logs may be required to correct the errors. Creating a set of data to provide to technical support can be done if you follow the menu "LMDS"\ "Creating data for technical support (SaveLog.exe)".

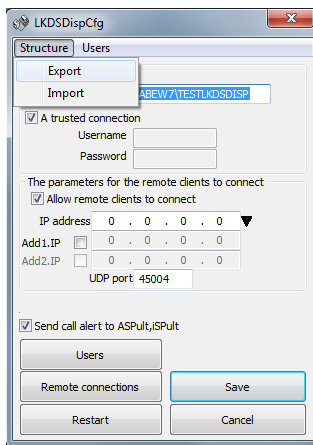
SPult creates and runs two logs:

- 1) Errors log – SPult.Bad file
- 2) Exchange with LKDSDisp log when connecting via UDP – LKDSProEN\SPult\LogSpultRmt folder.

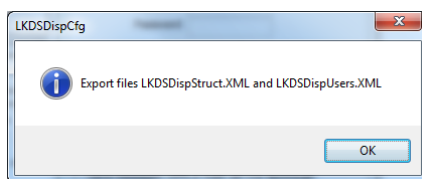
SPult/LKDSDisp exchange log will be started when SPult is run with parameter -l, i.e.

SPult.exe -l

Description of managed lifts and the users table are stored in SQL server database; LKDSDispCfg configurator allows extracting these data in two files and downloading the files to an empty database. Such export can be done by following the menu: "Structure"\ "Export".



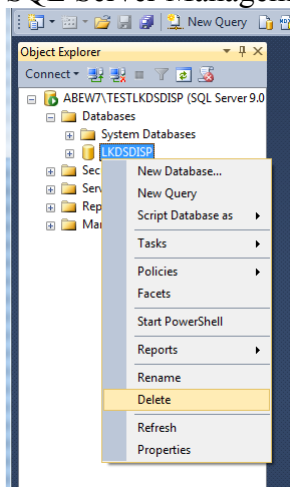
When successful, the following message will pop up:



The following files will be created: LKDSProEN\LKDSDisp\LKDSDispStruct.XML, LKDSProEN\LKDSDisp\LKDSDispUsers.XML. These files can be imported into an empty database: "Structure"\ "Import".

Export of structure may be used to create a backup copy, but it is preferable to use the tools of SQL server to make backup copies of databases. In that case not only structures, but also logs, drives operation statistics and errors logs are saved.

To restart operations, the previous LKDS DISP database must be deleted. Before that, close LKDSDispCfg and SPult programs and stop LKDSDisp service. After that in "Microsoft SQL Server Management Studio Express" delete LKDS DISP database:



At next start of LKDSDisp service an empty LKDS DISP database will be created.

If only SPult remote connection to LKDSDisp is planned you can download and install SPultENDst.msi installation file from www.lkds.ru instead of LKDSProEN.msi installation software.