

LKDSDomain Server

Step-by-step introduction.

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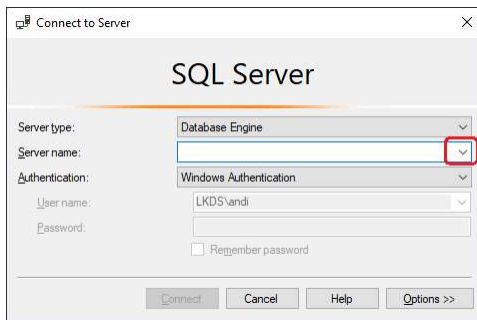
1. Initial LKDSDomain setup

Microsoft SQL Database is used for storing data, so Microsoft SQL Server should be downloaded and installed on your computer prior to making LKDSDomain setup. The free version of Microsoft SQL Server also available on Microsoft Software web page. The free version has two limitations: the database size should not exceed 10GB and some performance limitations. There are two files necessary to be downloaded from the web page:

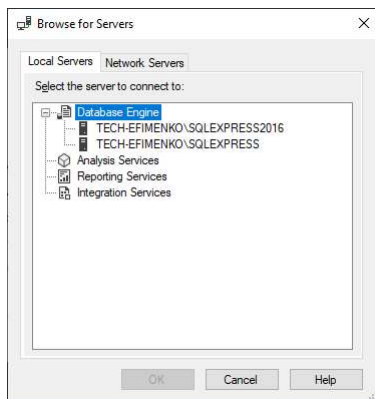
1. Microsoft SQL Server 2014 Express Edition (or newer version) – SQL Server itself;
2. Microsoft SQL Server Management Studio– SQL database management utility.

When installation of both files is complete, execute Microsoft SQL Server Management Studio».

The names of installed SQL servers could be viewed in opened window.

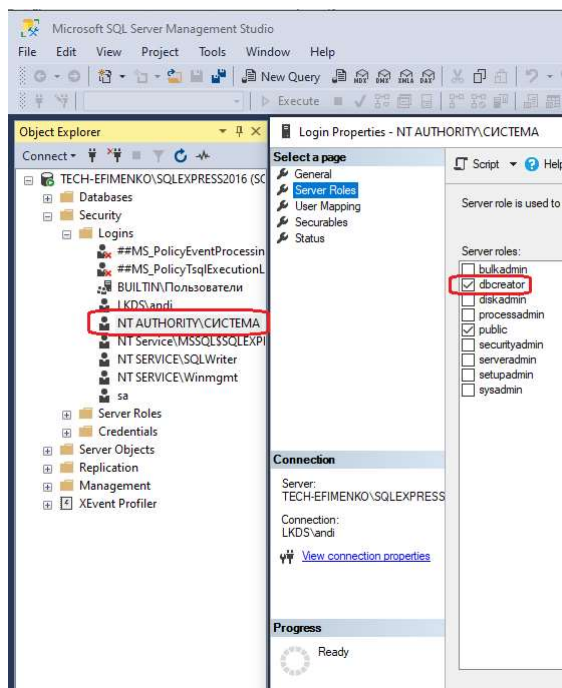


Press arrow button of the “Server name” field to select SQL server, select <Browse for more...> option, then expand “Database Engine” on tab «Local Servers»:



The name of SQL server will be used later for LKDSDomain setup.

Perform settings of System user then:



The initial LKSDDomain setup is made using LKSDDomainCfg.exe routine, that could be executed via menu: «LMDS» \ «Server dispatch LKSDDomain - setting (LKSDDomainCfg.exe)».

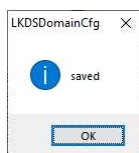
The window below opens at the routine startup:

The screenshot shows the LKSDomainCfg configuration window. It has a menu bar with 'Lift units', 'User teams', and 'Structure'. The 'SQL server options' tab is active. The 'Server name' field is empty. The 'Connection under Windows user' checkbox is checked. The 'Network connection settings' section includes fields for IP address, Don1.IP, Don2.IP, and various ports (48000, 48001, 49000, 49000, 10244791). The 'Log exchange only with (Ident)' field is set to 0. The 'OPC UA server parameters' section includes fields for Name (LKDSOpCUA), Port (opc.tcp://localhost:4841), Security (None - None), and Encryption key password. The 'Options for sending SMS messages' section includes checkboxes for enabling SMS and E-mail messages, and fields for Modem COM port, SMS center, SMTP server, and SMTP port. The 'Web connection settings' section includes checkboxes for accepting WEB connections and allowing non-secure connections, and fields for HTTP and HTTPS ports. The 'Save' button is highlighted with a blue border.

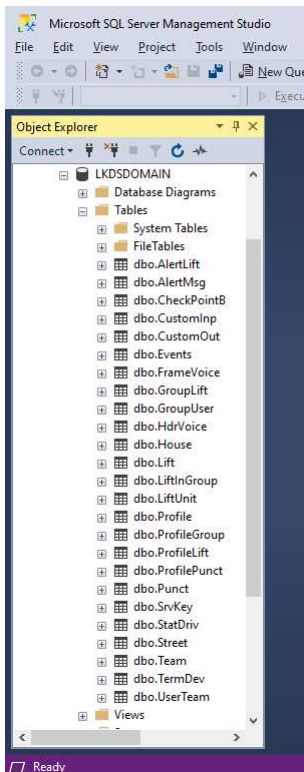
Enter SQL server name in Server Name field, then press Save button:

The screenshot shows the LKSDomainCfg configuration window with the 'Server name' field filled with 'TECH-EFIMENKO\SQLEXPRESS20'. The 'Save' button is highlighted with a red rectangle.

The message appears after successful saving:



And you can see the LKSDDOMAIN database:

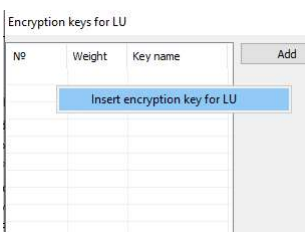
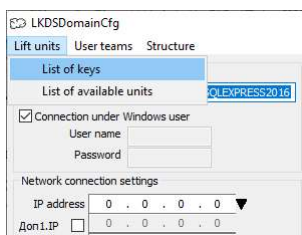


2. Adding LU 7.2 to LKDSDomain configuration

A Lift Unit 7.2 can be added to LKDSDomain configuration by either of two ways:

1. Assign a link to LKDSDomain. In this case the Lift Unit exchanges data with LKDSDomain directly using UDP port of LKDSDomain. We call it direct connection.
2. Assign the LKDSCloud service for the LKDSDomain and the Lift Unit data exchange. We call it transit via LKDSCloud.

Using either of ways, first of all, one must enter the primary (encryption) key of the Lift Unit.



Encryption key

Key

Repeat key

☐ Can be used to work with LU via UKDScloud

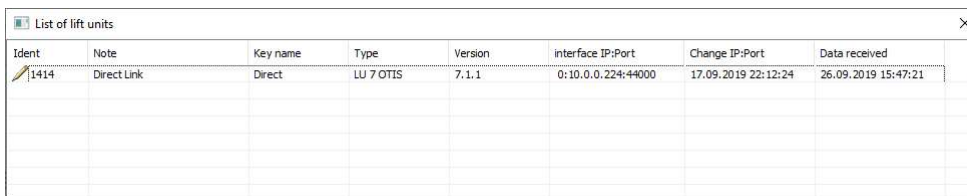
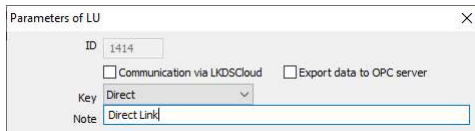
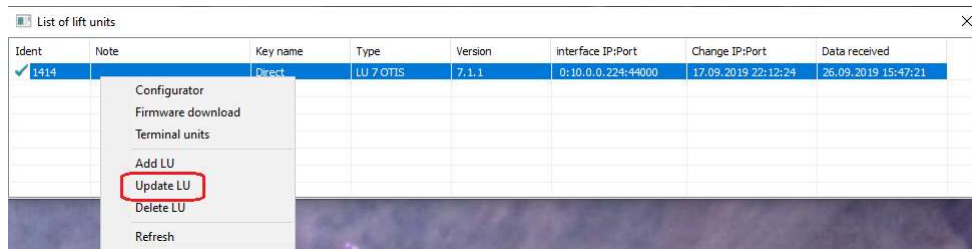
Weight of the key - the more, the for greater number of LU used

Name

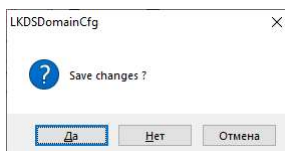
The link to LKSDomain is assigned for the Lift Unit using ConfigLBPro.exe utility:

If communication between the Lift Unit and the LKDSDomain has been established, the Lift Unit appears in the list. Otherwise, firewall settings should be checked up (UDP port 48000 inbound available), The utility Wireshark can be used to make sure the UDP packets in port 48000 are received by network adapter.

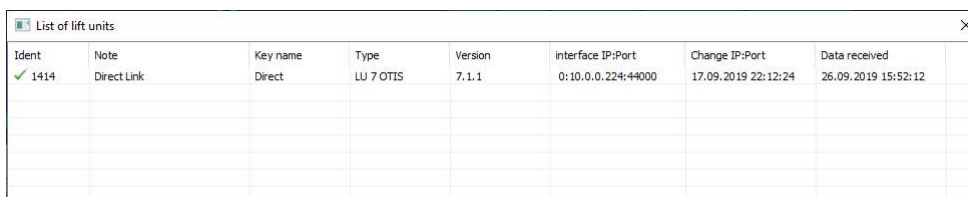
Necessary comments can be also added to the Lift Unit information..



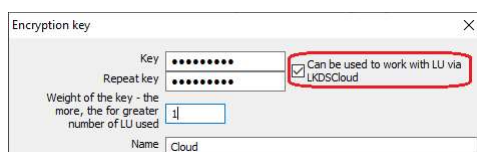
Exiting LKSDomainCfg utility or pressing “Save” button results in the confirmation window opens:



The comment will be saved after confirmation:



The encryption key should be entered for transit communication method. The checkbox “Can be used to work with LU via LKDSCloud” must be selected:



The Lift Unit that uses transit communication via LKDSCloud is highlighted cyan in the list:

Encryption keys for LU

№	Weight	Key name
1	1	Direct
2	1	Cloud

Add

After entering encryption key, add the Lift Unit itself:

LKSDomainCfg

Lift units User teams Structure

SQL server options

List of lift units

Ident	Note	Key name
✓ 1414	Direct Link	Direct

Add LU

Refresh

UDP voice port for communication with LU 48000

UDP port for communication with *SPult 48001

TCP port for communication with *SPult 49000

Identifier for communication with LU 10265292

Enter Lift Unit ID, the encryption key and notes:

Parameters of LU

ID 27308

☒ Communication via LKSDCloud ☐ Export data to OPC server

Key Cloud

Note Cloud Link

Using LKSDCloud, the encryption key and timezone should be added to the Lift Unit parameters.

List of lift units

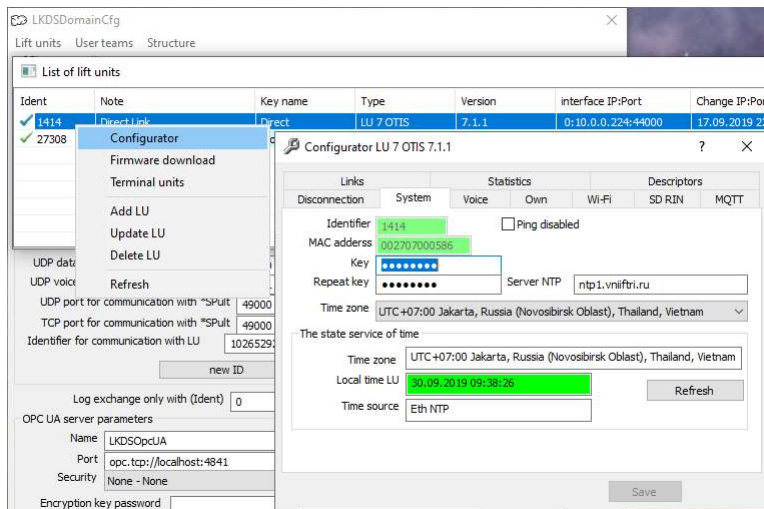
Ident	Note	Key name	Type	Version	interface IP:Port	Change IP:Port	Data received
✓ 1414	Direct Link	Direct	LU 7 OTIS	7.1.1	0:10.0.0.224:44000	17.09.2019 22:12:24	30.09.2019 08:45:16
✚ 27308	Cloud Link	Cloud	(0) (0)	0.0.0	0:0.0.0.0:0		

And all configuration parameters will be saved as well:

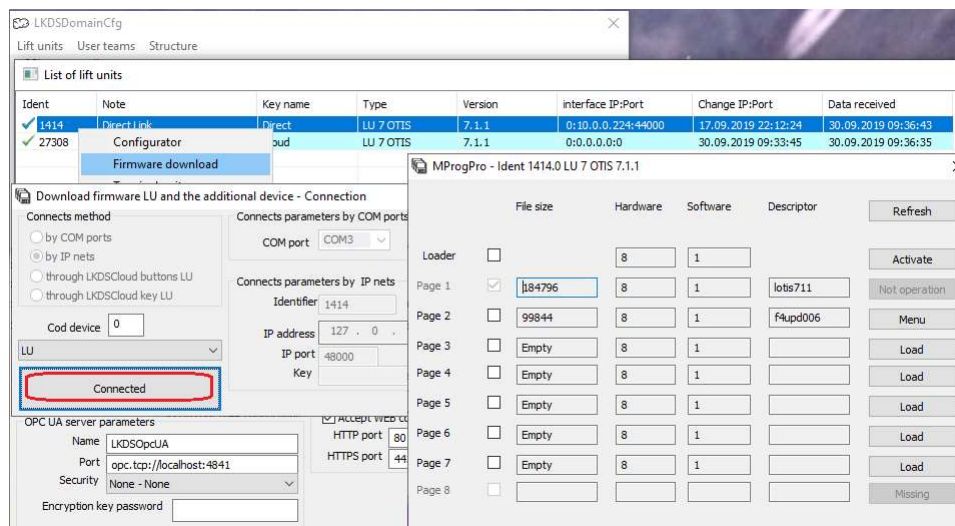
List of lift units

Ident	Note	Key name	Type	Version	interface IP:Port	Change IP:Port	Data received
✓ 1414	Direct Link	Direct	LU 7 OTIS	7.1.1	0:10.0.0.224:44000	17.09.2019 22:12:24	30.09.2019 09:14:29
✓ 27308	Cloud Link	Cloud	LU 7 OTIS	7.1.1	0:0.0.0.0:0	30.09.2019 09:14:18	30.09.2019 09:14:28

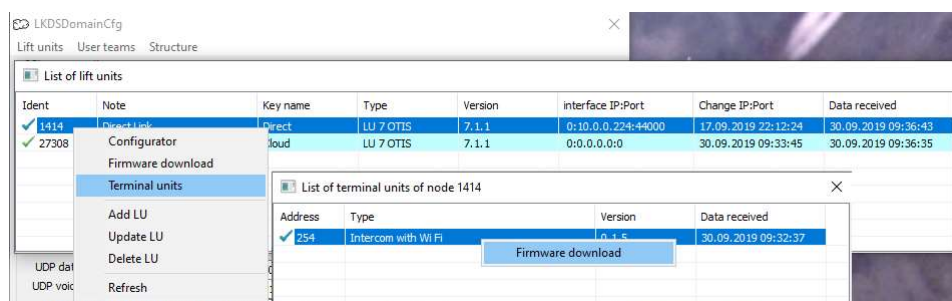
The Lift Unit configuration utility can also be invoked using context menu while browsing the list of the Lift Units:



The firmware of the Lift Unit can be uploaded directly:



The peripheral devices can be browsed and the firmware of the peripheral devices can also be uploaded:



3. Using Lift Unit 7.2 and LKSDomain.

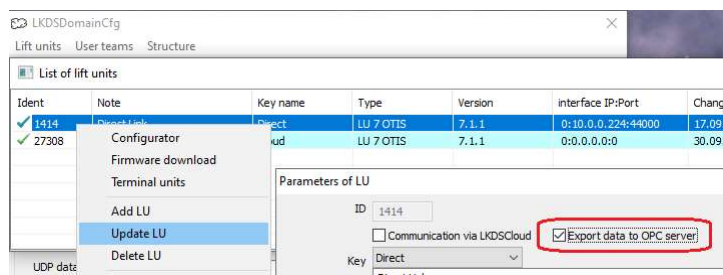
There are two methods of saving, visualizing and analyzing data received from the Lift Unit:

- 1.Using external SCADA systems.
- 2.Using built in LKSDDomain monitoring server and client's applications.

3.1. External SCADA systems.

Two open standard industrial protocols supported by LKSDDomain- OPC UA and OPC DA, to export data into external SCADA systems.

Allow the Lift Unit exporting data as shown:



The Lift Units that export data to external systems are being highlighted (Ident column) with light green while browsing:

Ident	Note	Key name	Type	Version	interface IP:Port	Change IP:Port	Data received
1414	Direct Link	Direct	LU 7 OTIS	7.1.1	0:10.0.0.224:44000	17.09.2019 22:12:24	30.09.2019 09:36:43
27308	Cloud Link	Cloud	LU 7 OTIS	7.1.1	0:0.0.0.0:0	30.09.2019 09:33:45	30.09.2019 09:36:35

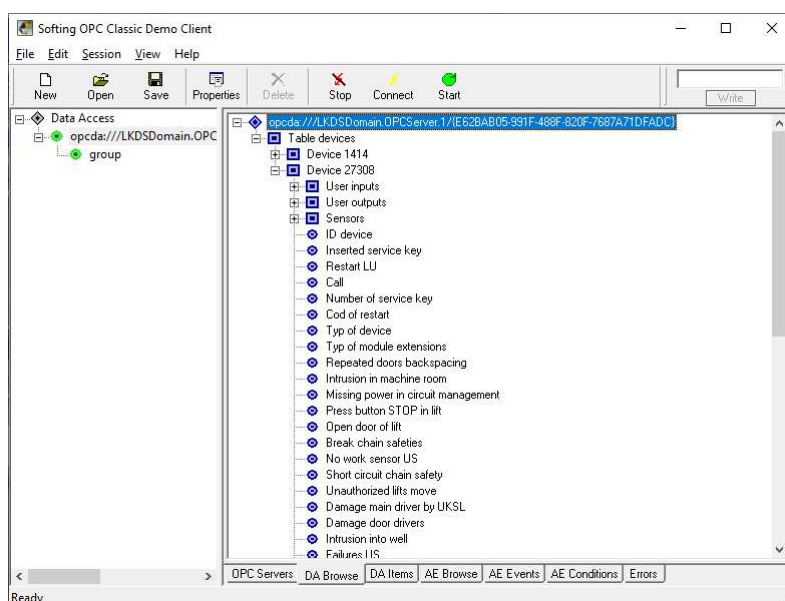
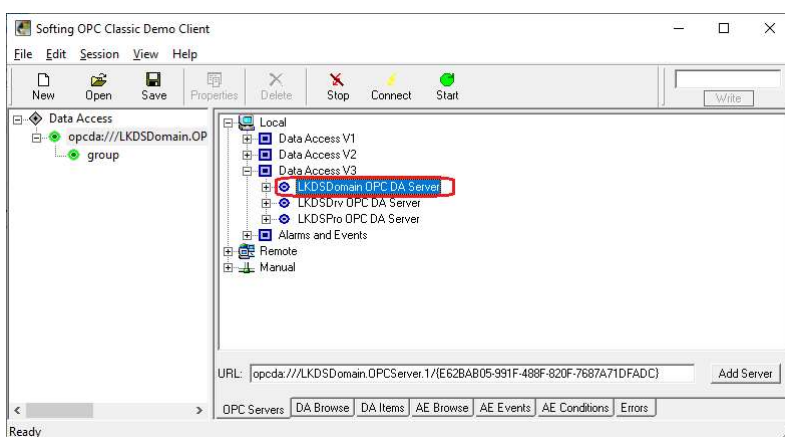
The list of exported variables:

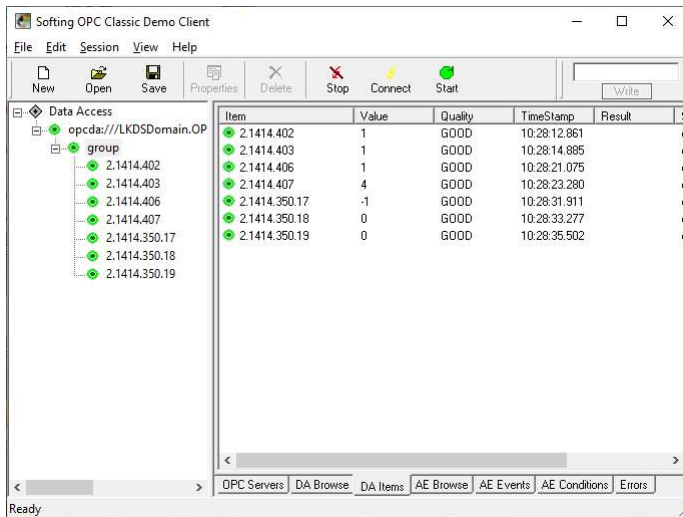
ID of item (ItemID)	Name of item
2.<ID_LU>.1	Identifier LU
2.<ID_LU>.100	Inserted service key
2.<ID_LU>.101	Restart LU
2.<ID_LU>.102	Call
2.<ID_LU>.104	Number of service key
2.<ID_LU>.105	Cod of restart
2.<ID_LU>.106	Typ of device
2.<ID_LU>.107	Typ of module extensions
2.<ID_LU>.301	Repeated doors backspacing
2.<ID_LU>.302	Intrusion in machine room
2.<ID_LU>.303	Missing power in circuit management
2.<ID_LU>.304	Press button STOP in lift
2.<ID_LU>.305	Open door of lift
2.<ID_LU>.306	Break chain safeties
2.<ID_LU>.307	No work sensor US
2.<ID_LU>.308	Short circuit chain safety
2.<ID_LU>.309	Unauthorized lifts move
2.<ID_LU>.310	Damage main driver by UKSL
2.<ID_LU>.311	Damage door drivers

2.<ID_LU>.312	Intrusion into well
2.<ID_LU>.313	Failures US
2.<ID_LU>.314	Emergency lock
2.<ID_LU>.315	Open machine room
2.<ID_LU>.316	Lift between floors
2.<ID_LU>.317	No work sensor DC
2.<ID_LU>.318	Open doors well by US
2.<ID_LU>.319	Main driver turn on
2.<ID_LU>.320	User bit
2.<ID_LU>.321	Jumper starters
2.<ID_LU>.322	Lock RM without RMD
2.<ID_LU>.323	Refining call - from machine room
2.<ID_LU>.324	Fault voice route
2.<ID_LU>.325	Power backup LU
2.<ID_LU>.326	Alternating voltage in CS
2.<ID_LU>.327	Fire risk
2.<ID_LU>.328	Not link
2.<ID_LU>.348.1	Status USER1
2.<ID_LU>.348.2	Status USER2
2.<ID_LU>.348.3	Status USER3
2.<ID_LU>.348.4	Status USER4
2.<ID_LU>.349.1	Output OUT1
2.<ID_LU>.349.4	Output OUT4
2.<ID_LU>.350.1	FUSE - power in circuit management
2.<ID_LU>.350.2	STOP1 - before key STOP
2.<ID_LU>.350.3	STOP2 - after key STOP
2.<ID_LU>.350.4	DC1 - before of contact doors cars
2.<ID_LU>.350.5	DC2 - after of contact doors cars
2.<ID_LU>.350.6	RDC - relay of doors control (end chain safety)
2.<ID_LU>.350.7	ROD - relay of doors opening
2.<ID_LU>.350.8	RCD - relay of doors closing
2.<ID_LU>.350.9	AL - automatic lock
2.<ID_LU>.350.10	MR - sensor of intrusion in machine room
2.<ID_LU>.350.11	CALL - key CALL in car or MR
2.<ID_LU>.350.12	ESCA - exist impulses from ESCA
2.<ID_LU>.350.13	VC - detected voice caller
2.<ID_LU>.350.14	Doors staus (open/close)
2.<ID_LU>.350.15	Sign of move up
2.<ID_LU>.350.16	Sign of move down
2.<ID_LU>.350.17	Exist 15kg in car
2.<ID_LU>.350.18	Exist 90% load of car
2.<ID_LU>.350.19	Exist 110% load of car
2.<ID_LU>.350.20	Exist damage in MCS
2.<ID_LU>.350.21	Sensor of precise stop
2.<ID_LU>.350.22	Mode of lifts work
2.<ID_LU>.350.23	Cod of damage
2.<ID_LU>.350.24	Calls from floors
2.<ID_LU>.350.25	Board of commands
2.<ID_LU>.350.28	RD - relay of movement
2.<ID_LU>.400	Turn on lift
2.<ID_LU>.401	Turn off lift
2.<ID_LU>.402	Number current floors
2.<ID_LU>.403	Total number of floors
2.<ID_LU>.404.1	Number first open doors at the damage
2.<ID_LU>.404.1	Number second open doors at the damage
2.<ID_LU>.405	Lift between floors
2.<ID_LU>.406	Status lift moves: <ul style="list-style-type: none"> • 0 - N/A • 1 - in motion • 2 - moving UP

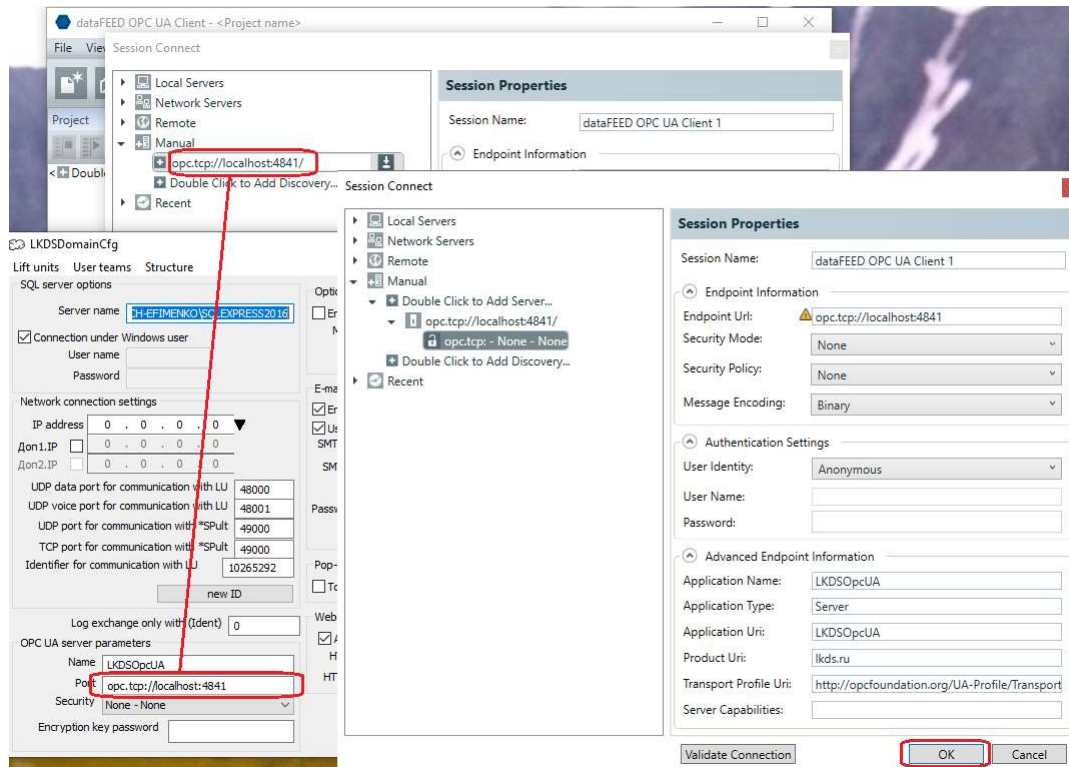
	<ul style="list-style-type: none"> • 3 - moving DOWN • 4 - Not moving
2.<ID_LU>.407	Status doors of lift: <ul style="list-style-type: none"> • 0 – N/A • 1 – opening • 2 – opened • 3 – closing • 4 – closed
2.<ID_LU>.408	Errors cleaning
2.<ID_LU>.409	Message MCS Integer 32 bit. Value 0xFFFFFFFF (all bits are set to 1) means no messages from controller, any other value means the messages are received

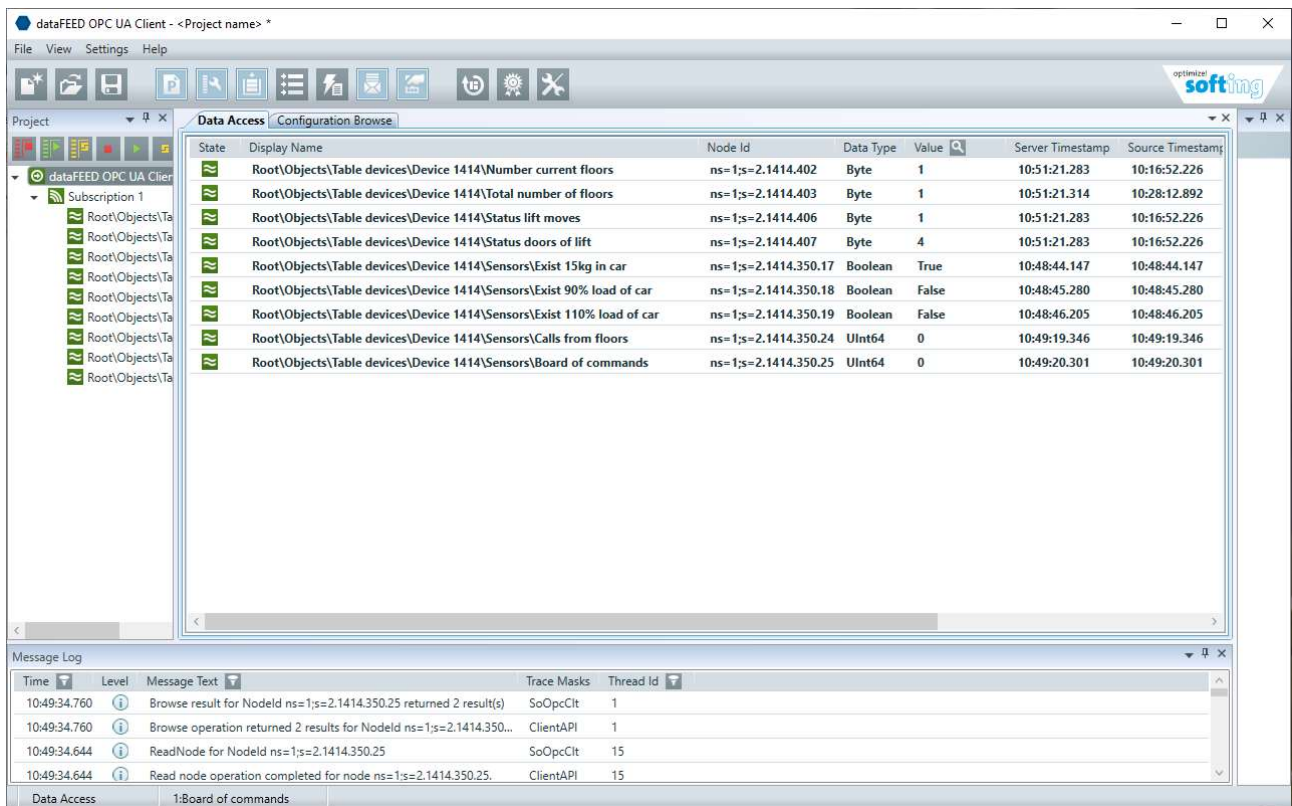
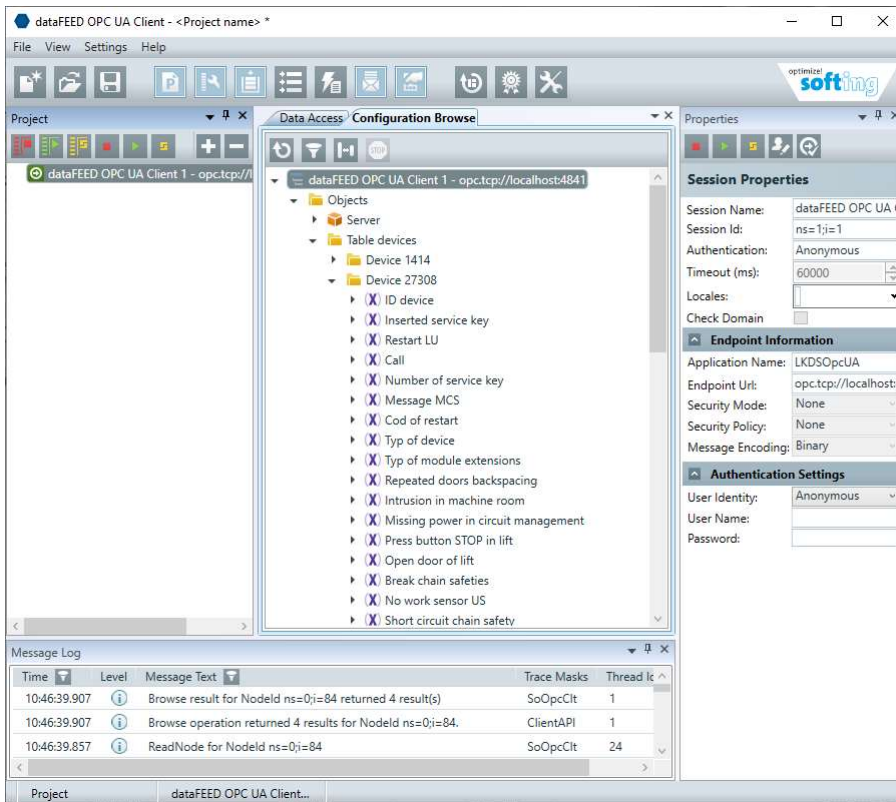
3.1.1 Examples of LKSDDomain OPC DA variables





3.1.2 LKSDDomain server OPC UA. Viewing address range.





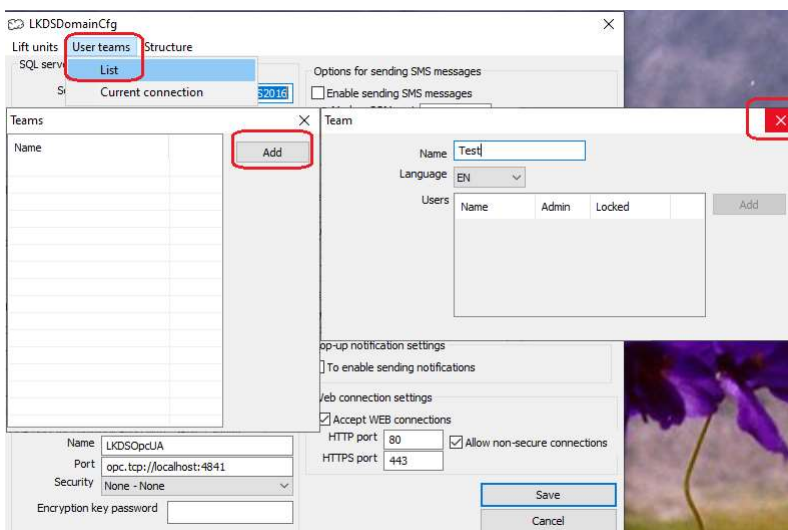
3.2 Use of built in monitoring server.

Monitoring server can support multiple organizations (Teams). Each of team has its own set of lifts and users. Users have an access to lifts according to granted rights.

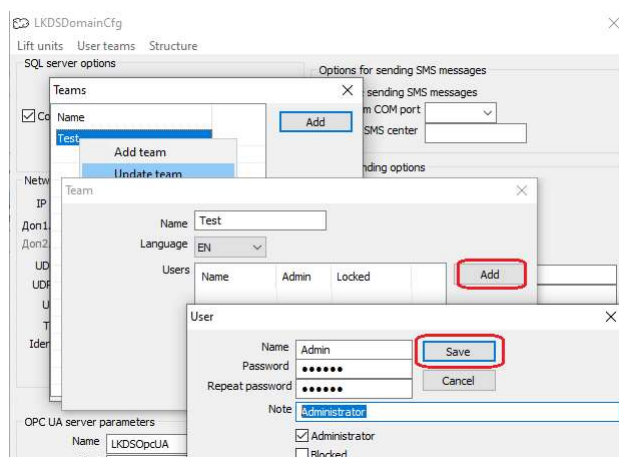
3.2.1. Registering a Team

Before you use LKSDDomain monitoring server, you should define the user having administrative rights for your Team. This defined user will make further steps.

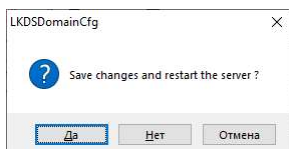
To register a Team “User teams” menu option is used. Select it and then press “Add” button.



When your Team is in the list of Teams, you should enter an administrator:



After saving and confirmation, exit the LKSDomainCfg routine:

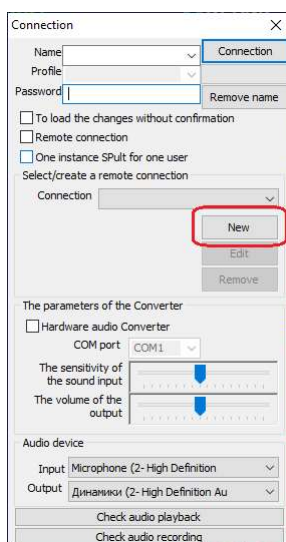


Execute “LMDS” \ “Client - server solution - Dispatching lifts (SPult.exe)” to make further steps on customizing your Team.

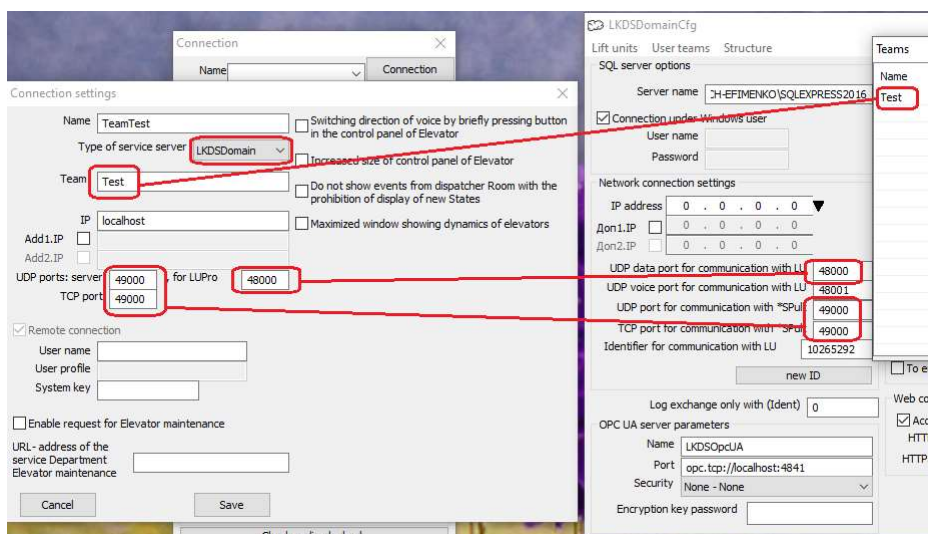
3.2.2. Customizing a Team.

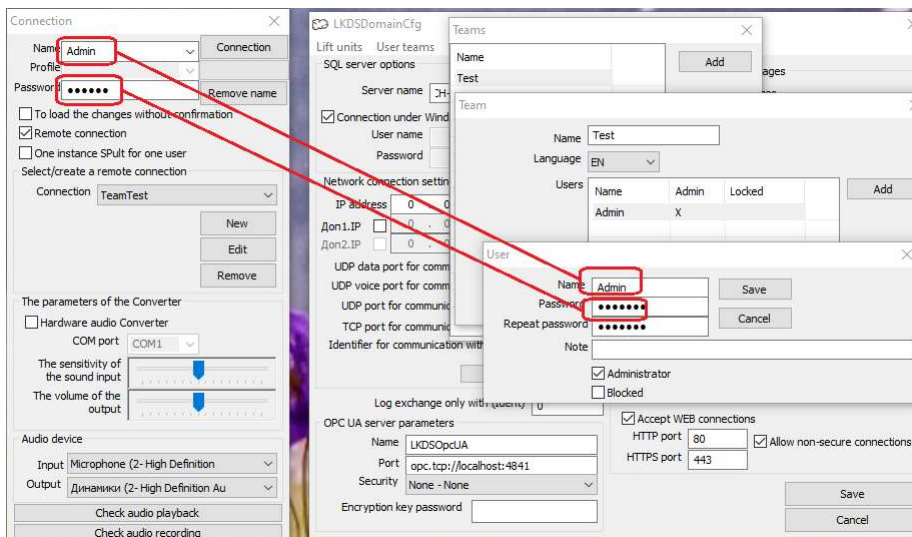
Execute SPult utility and login as the Administrator.

The window called “Connection” appears. First, parameters of establishing a connection to LKSDomain server should be entered. To do so, press “New” button:



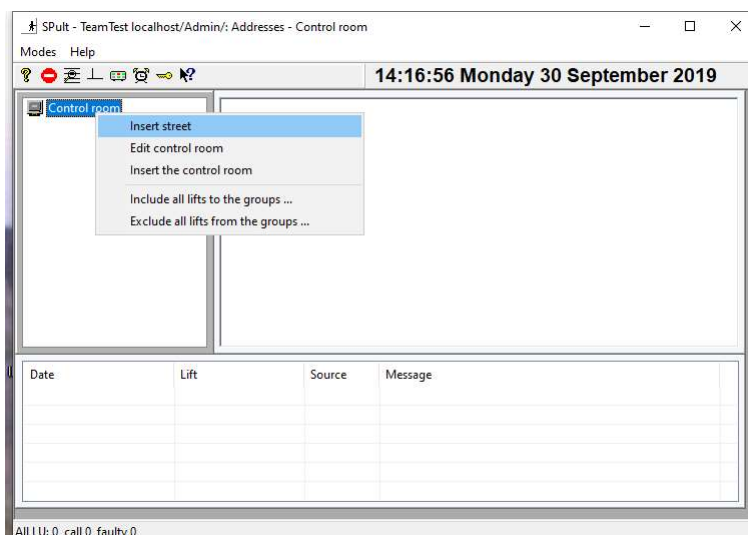
And enter the values as shown:

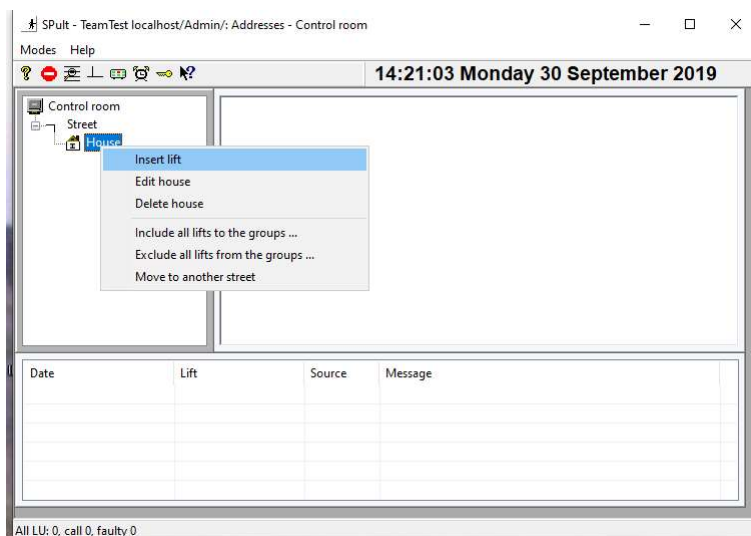
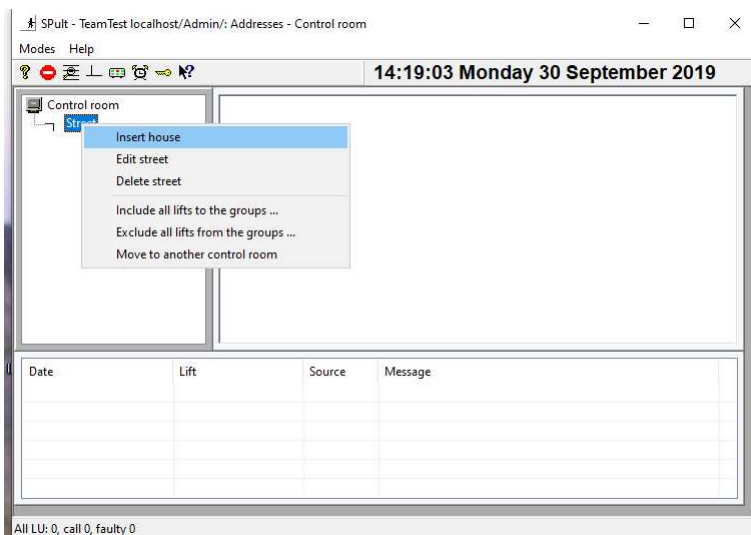




Press “Save” button and the window closes. Now enter the credentials of the administrator, then press «Connection» button:

If connection is established, the window shown below appears. Left window is meant for inserting lifts for monitoring:



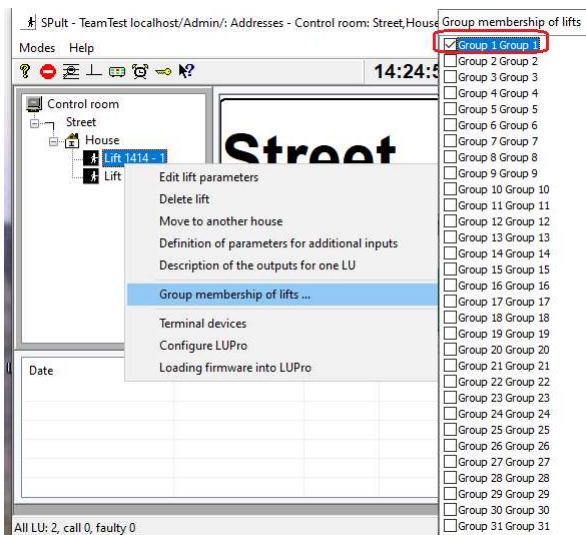


It is important to enter Lift Unit ID correctly:

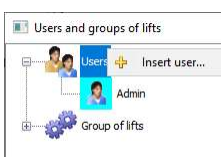
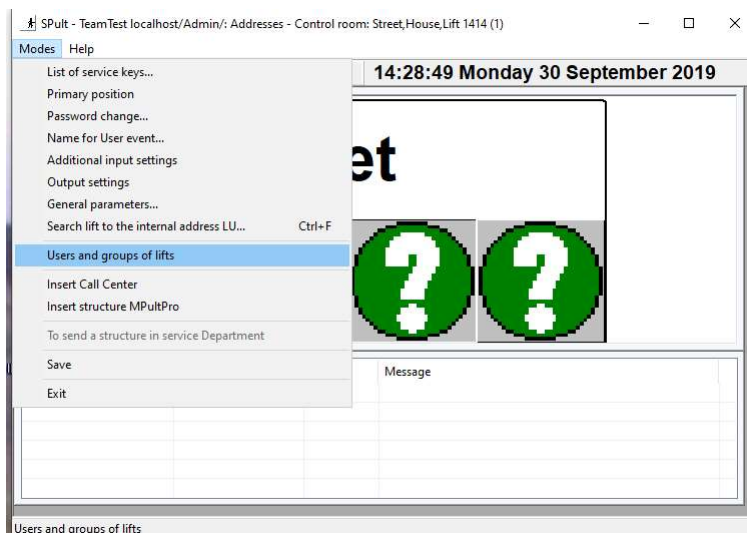
Street,House,e. (1)

General parameters		Lift reference parameters	
Entrance	Lift 1414	Lift owner	
Abbreviation	1	Headman	
Unique code	03EE951E1A5E46DD89A967CB0907F2C0	Serviceman	
User event		Registration N	
Type	Lift	Lift type	
Number of floors under	0	Elevating capacity,kg	
	<input checked="" type="checkbox"/> Managed	Speed, m/sec	
		Number of stops	
		Start-up year	
Link provider with LU	Direct connection	Next engineering certification	
		Lift manufacturer	
		Lift drive reducer	
		Lift drive	
		Traction sheave, mm	
		Control cabinet	
		Communications	
		Factory N LU	
Camera-recorder parameters		Note	
Command string			

It is more convenient to grant access rights on a group of lifts, instead of on a specific lift. Each Team can have at most 31 groups of lifts. A lift can be a member of several groups:



Insert as many operators (users in charge of monitoring) as necessary, then grant them necessary rights on certain groups of lifts:



Any user must have login and password, as well as some additional parameters that allow to send messages to the user in accordance with changes of status.

User

Name: User

Password: *****

Repeat password: *****

Note:

Phone: ☐ To send alerts via SMS

E-mail: ☐ Send email alerts

☐ Send pop-up notifications

Valid time to send alerts

from: 0:00:00 up to (including): 23:59:59

☒ Monday
☒ Tuesday
☒ Wednesday
☒ Thursday
☒ Friday
☒ Saturday
☒ Sunday

☐ Do not send an alert in the MS mode (when inserted SK)

Users and groups of lifts

- Users
 - Admin
 - User
- Group of lifts
 - Group 1

Access and rights to groups of lifts...

Insert user...

Change user...

Assign administrator rights

Block user

Make user "User" heir of another user...

Delete user "User"

Set default profile...

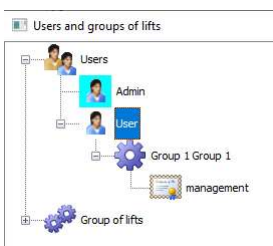
Add for user "User" notify on events...

Lifts, is not accessible to this user "User"

Lifts, is accessible to this user "User"

Access and rights to lifts groups of user - User

Access/rights	Group 1
access	X
management	X
setting	
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	



3.2.3. Monitoring using SPult.

When steps above are made, it is possible to login under operator's account and start monitoring.

Connection

Name: User Connection

Profile:

Password: ***** Remove name

☐ To load the changes without confirmation

☒ Remote connection

☐ One instance SPult for one user

Select/create a remote connection

Connection: TeamTest

New

Edit

Remove

The parameters of the Converter

☐ Hardware audio Converter

COM port: COM1

The sensitivity of the sound input:

The volume of the output:

Audio device

Input: Microphone (2-High Definition)

Output: Динамик (2-High Definition Au)

Check audio playback

Check audio recording

After connection is established the window below opens:

SPult - TeamTest localhost/User/: Addresses - Control room: Street,House,Lift 1414 (1)

Modes Reports Help

14:47:23 Monday 30 September 2019

Control room

- Street
 - House
 - Lift 1414 - 1
 - Lift 27308 - 2

Street

House

e

Date	Lift	Source	Message
30.09.2019 14:45:22		Operator	Start - User
30.09.2019 14:45:39		Operator	Enter password for customizings
30.09.2019 14:45:39		Operator	Mode - Customizing
30.09.2019 14:47:00		Operator	Mode - Operator

All LU: 2, call 0, faulty 2

Double click the lift pictogram to open window with detailed information on the lift:

Street,House,Lift 1414 (1) - MR

Status on: 14:48:28 LU 7 OTIS v7.1.1

Intrusion into well

Open machine room

Main driver turn on

Lift in movement

Turn on LSC with lift Turn on LSC with MR

Turn off LSC

Refresh status

Close

Set a response only to the call

LU sensor:

FUSE ☒ RD ☒

STOP1 ☒ ESCA ☒

STOP2 ☒ ROD ☒

DC1 ☒ RCD ☒

DC2 ☒ CALL ☒

RED ☒ AL ☒

DW ☒ MR ☒

Additional input

User1 ☐ User3 ☐

User2 ☐ User4 ☐

Terminal

Commands:

Execute

Suspend service

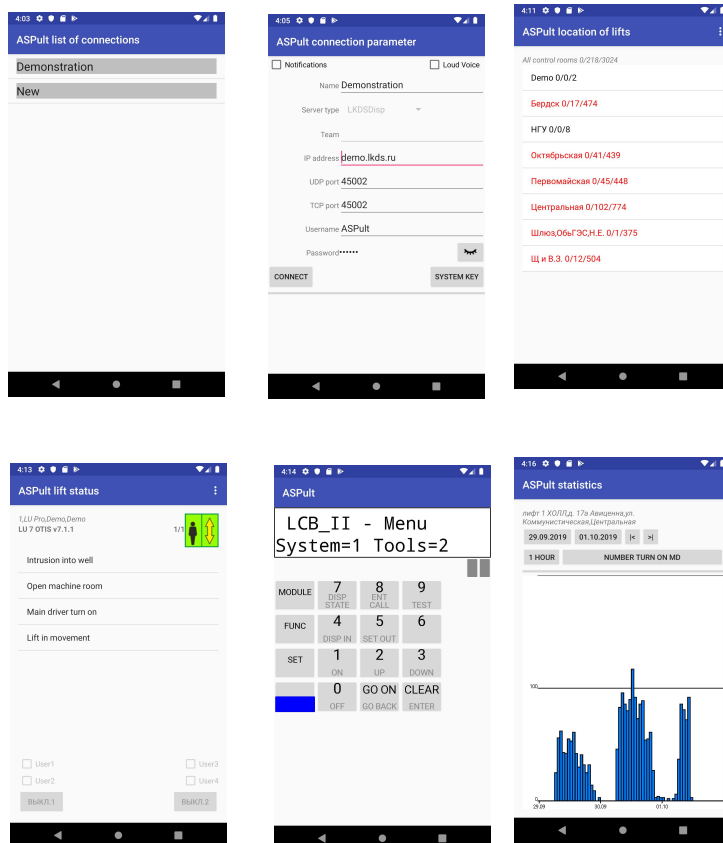
Errors cleaning

Turn off Output 1

Turn off Output 2

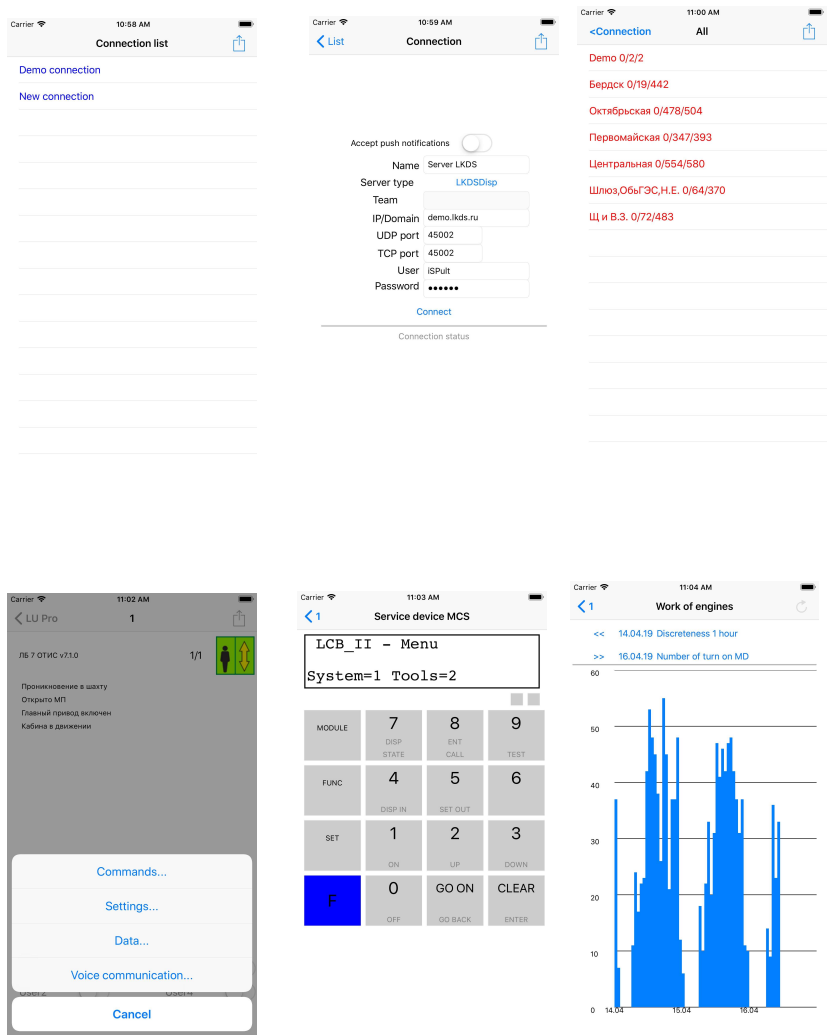
3.2.4. Monitoring using ASPult .

Use the link <https://play.google.com/store/apps/details?id=lkds.aspult> in Play Market to download free ASPult application. With this application you can monitor your lifts from your tablet PC or smartphone with Android operation system installed.



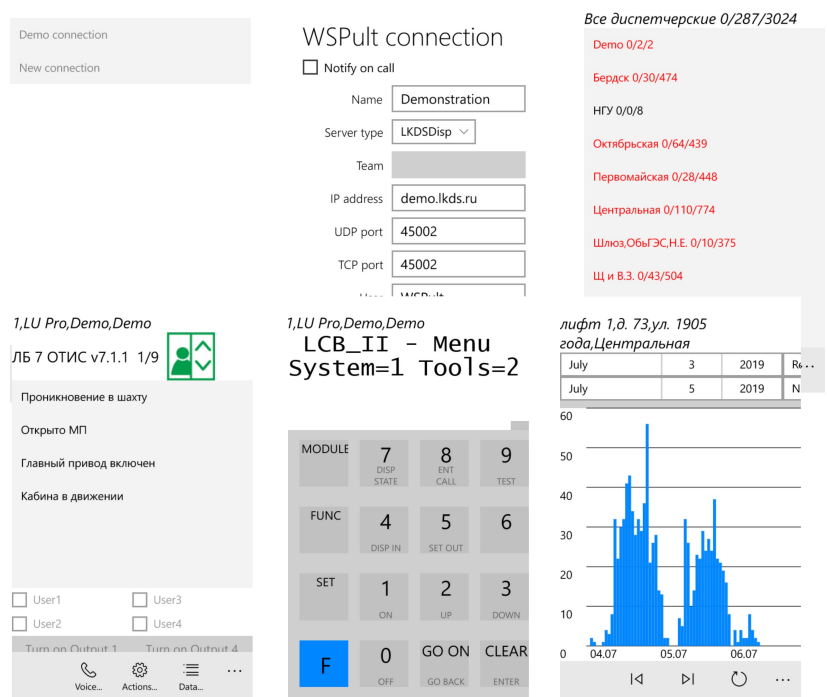
3.2.5. Monitoring using iSPult.

Use the link <https://apps.apple.com/us/app/ispult/id979453148?l=en&ls=1> in AppStore to download free iSPult application. With this application you can monitor your lifts from your tablet PC or smartphone with iOS operation system installed.



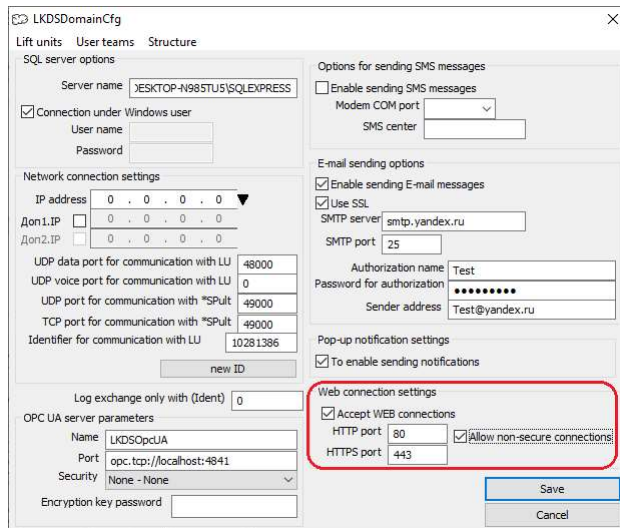
3.2.6. Monitoring using WSPult.

Use the link <https://www.microsoft.com/p/wspult/9mx3v7g0mvj3?rtc=4&activetab=pivot:overviewtab> in Microsoft Store to download free WSPult application. With this application you can monitor your lifts from your tablet PC or smartphone working under Microsoft operation system.



3.2.7. Using built in WEB interface.

Make built in WEB interface available:



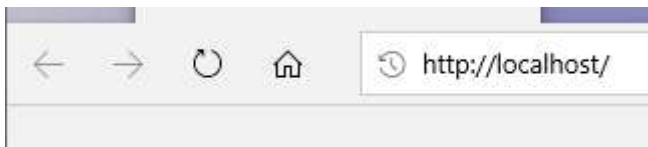
The screenshot shows the LKDSDomainCfg configuration window. The 'Web connection settings' section is highlighted with a red rectangle. It contains the following options:

- ☒ Accept WEB connections
- HTTP port: 80
- HTTPS port: 443
- ☒ Allow non-secure connections

Other visible settings include:

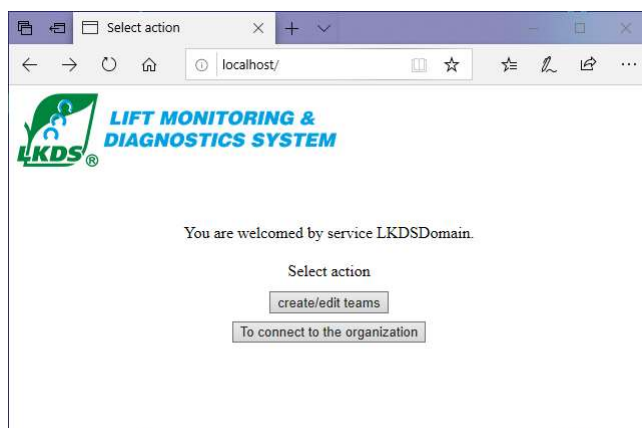
- Server name: DESKTOP-N985TJ5\SQLEXPRESS
- Connection under Windows user: ☒
- User name: [empty]
- Password: [empty]
- Network connection settings: IP address 0.0.0.0, Don1.IP 0.0.0.0, Don2.IP 0.0.0.0, UDP data port 48000, UDP voice port 0, UDP port 49000, TCP port 49000, Identifier 10281386.
- Log exchange only with (Ident): 0
- OPC UA server parameters: Name LKDSOpclUA, Port opc.tcp://localhost:4841, Security None - None, Encryption key password [empty].
- Options for sending SMS messages: ☐ Enable sending SMS messages, Modem COM port [empty], SMS center [empty].
- E-mail sending options: ☒ Enable sending E-mail messages, ☒ Use SSL, SMTP server smtp.yandex.ru, SMTP port 25, Authorization name Test, Password for authorization [empty], Sender address Test@yandex.ru.
- Pop-up notification settings: ☒ To enable sending notifications.

And connect to LKDSDomain:

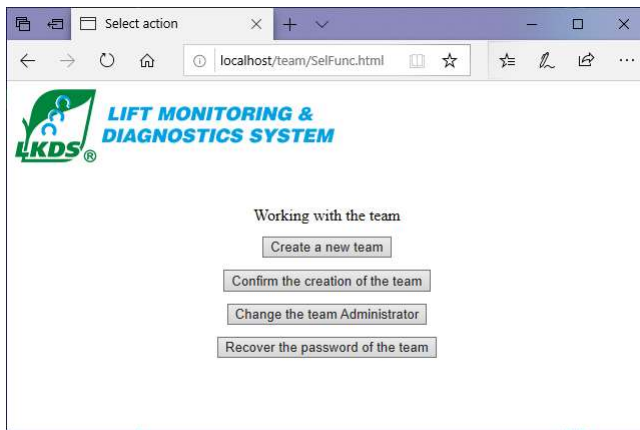


Two features are available:

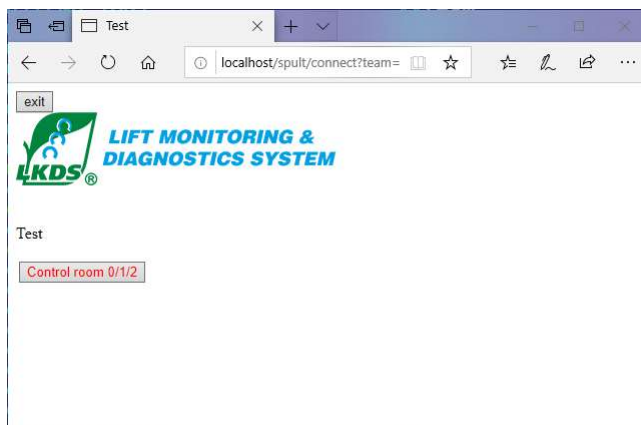
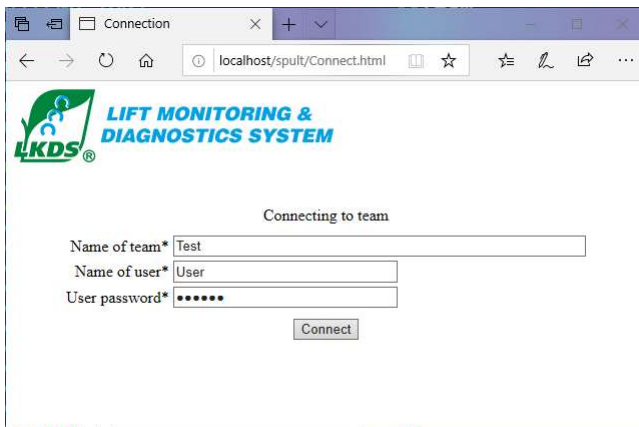
- 1.Remote Team creation.
- 2.Monitoring lifts of your Team.

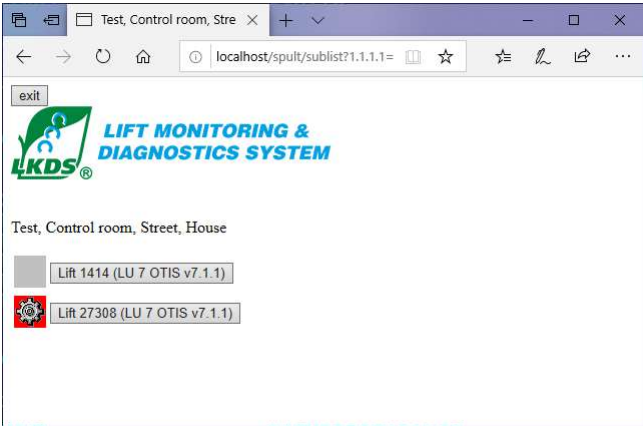
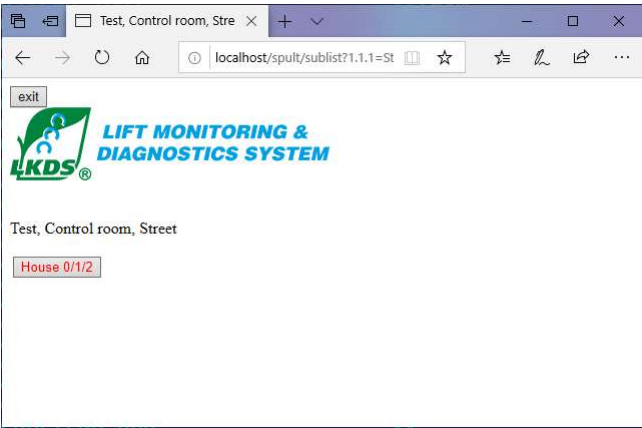
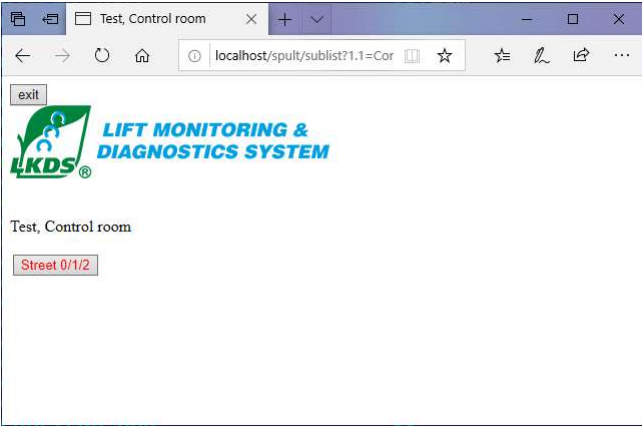


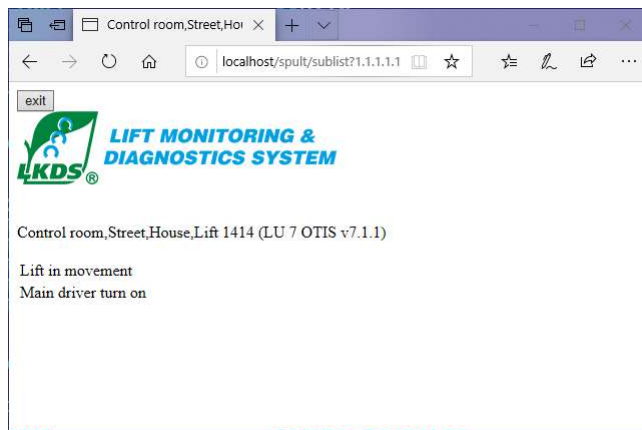
Interface for Remote Team creation looks like below:



To make a connection to your lifts:







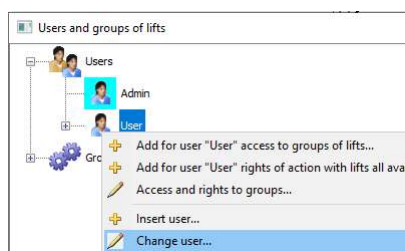
3.2.8. SMS and Email alerting.

LKSDomain can alert you using:

- 1.SMS messages
- 2.Email messages
- 3.Push notification for ASPult and iSPult applications.

Fill in the following fields in LKSDomainCfg routine:

Then, login as Administrator in SPult to grant users the right to receive messages, also enter Email addresses and mobile numbers of users.:



User

Name: User

Password:

Repeat password:

Note:

Phone:

E-mail: my@yandex.ru

☐ To send alerts via SMS

☒ Send email alerts

☒ Send pop-up notifications

Valid time to send alerts

from 0:00:00 up to (including) 23:59:59

☒ Monday

☒ Tuesday

☒ Wednesday

☒ Thursday

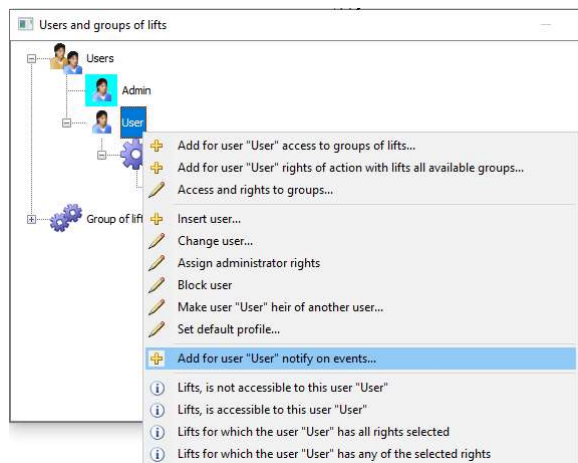
☒ Friday

☒ Saturday

☒ Sunday

☐ Do not send an alert in the MS mode (when inserted SK)

You can also specify the messages that will be sent to a user:



User

☐ Notification of errors in the operation of the server itself

Even 148

Call

The searched substring

Sent note

☒ Send for all available elevators

☒ Send an alert when the event disappears

☐ Do not send an alert in the MS mode (when inserted SK)

☐ Add the name of the control room to the Elevator address

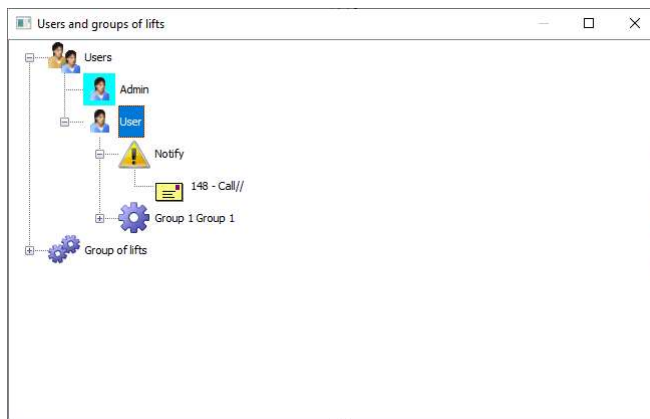
When the event re-appears, send a notification no earlier than after 0 min

☐ To send alerts via SMS

☒ Send email alerts

☒ Send pop-up notifications

☐ Send this alert once to check for alert delivery methods (after saving the configuration)



4. Migrating the structure from the LKDSDisp server to the LKSDDomain server.

LKSDDomain application server is a further development of LKDSDisp application server. LKSDDomain application server fully implements the capabilities of LKDSDisp application server and provides new features.

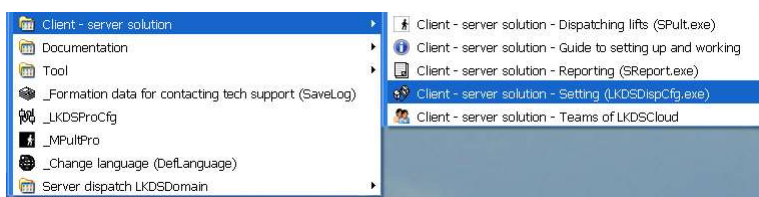
LKSDDomain application server and the LKDSDisp application server can both run on the same computer and use the same MS SQL server.

LKSDDomain application server and the LKDSDisp application server can receive data from the same LU at the same time. At the same time, they do not affect each other's work.

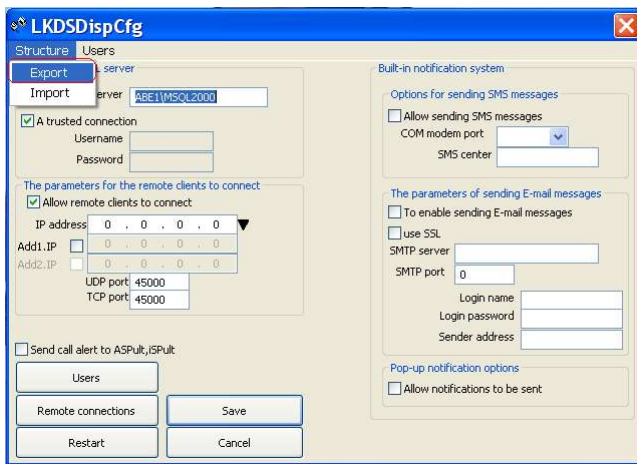
To learn LKSDDomain, there is a simple procedure to migrate the structure from LKDSDisp.

4.1. Unloading the structure from LKDSDisp.

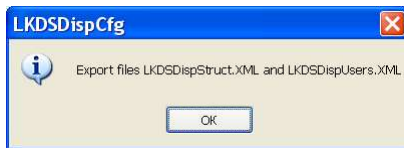
In LKDSDispCfg application:



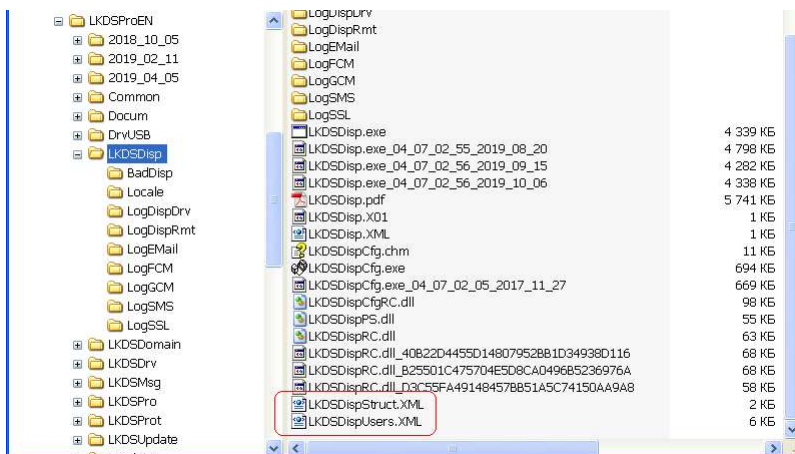
You need to select a menu item "Structure" \ "Export":



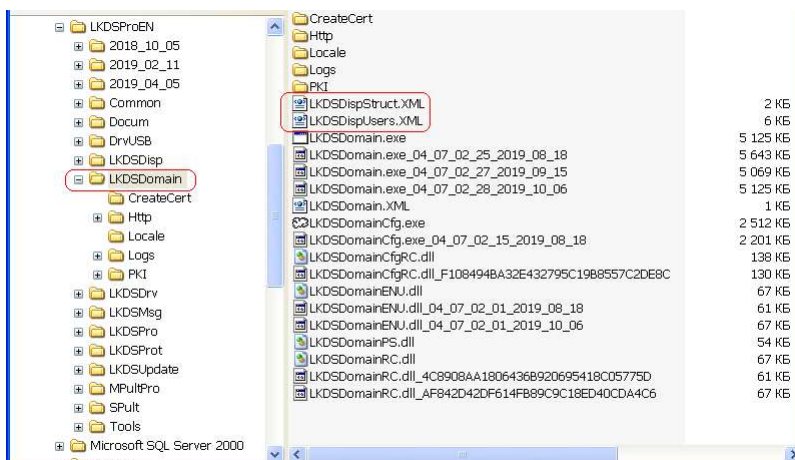
If the export is successful, a message will appear:



The files are in folder \LKDSProEN\LKSDisp\:



Copy the files to the folder \LKDSProEN\LKSDomain\:

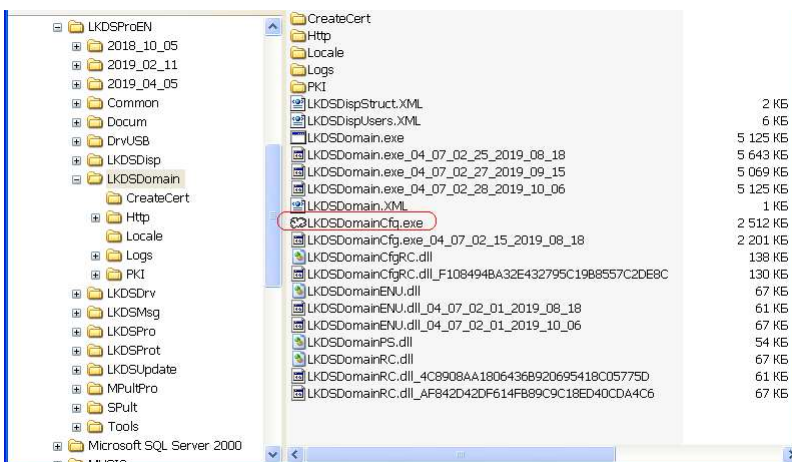


4.2. Import structure into LKSDDomain

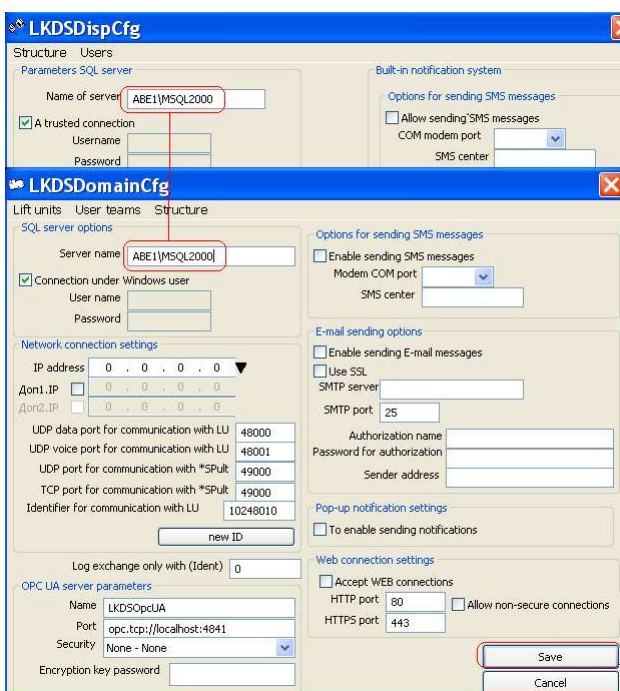
Run the LKSDDomainCfg application:



If there is no such menu item, then run LKSDomainCfg from the folder \LKDSProEN\LKSDomain\:

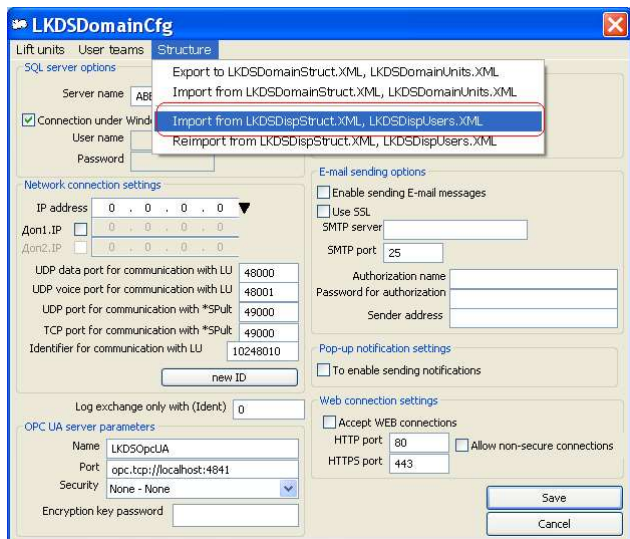


In the "Name of server" field, enter the same value as in the "Name of server" field of LKSDispCfg and save:

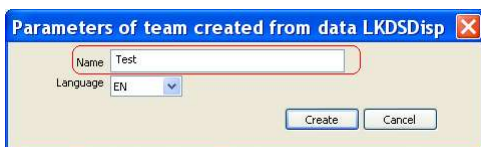


If the save is successful, a message will appear:

Then run LKSDDomainCfg again and select the menu item «Structure» \ “Import from LKSDDispStruct.xml, LKSDDispUsers.xml”:



LKSDDomain supports several structures contained in LKSDDisp. Each structure has a name and language. Therefore the name and language of the structure must be entered:



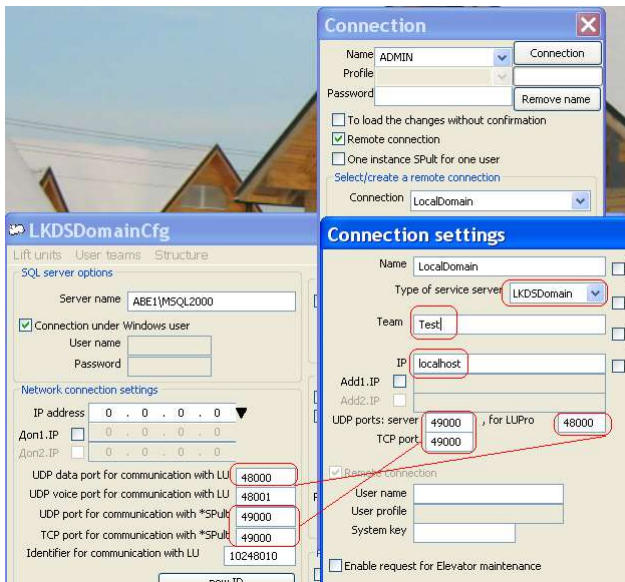
If the import is successful, a message will appear:



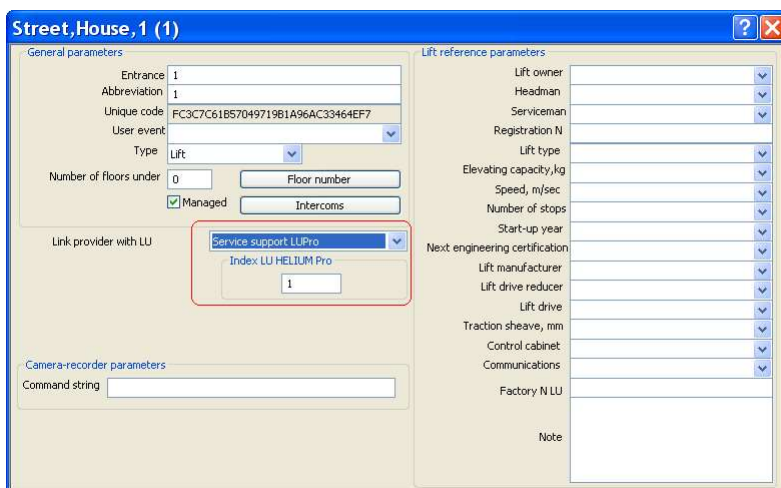
After import, you can connect to LKSDDomain using SPult, ASPult, iSPult, WSPult.

4.3. Connect to LKSDDomain from SPult.

SPult is connected to LKSDDomain only remotely. Even if SPult and LKSDDomain run on the same computer. Connection parameters can be as follows:



If link with the LU is described in LKDSProCfg, the LU index is specified (LKDSProCfg):



If the connection to the LU is direct, the LU identifier is specified:

