LKDSDomain Server

Step-by-step introduction.

Content

1. Initial LKDSDomain setup

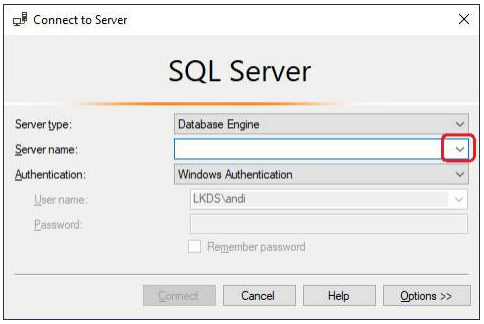
Microsoft SQL Database is used for storing data, so Microsoft SQL Server should be downloaded and installed on your computer prior to making LKDSDomain setup. The free version of Microsoft SQL Server also available on Microsoft Software web page. The free version has two limitations: the database size 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;

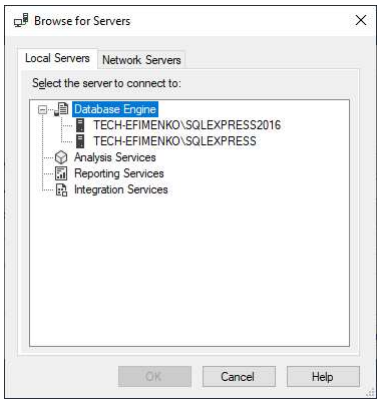
2.Microsoft SQL Server Management Studio– SQL database management utility.

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.

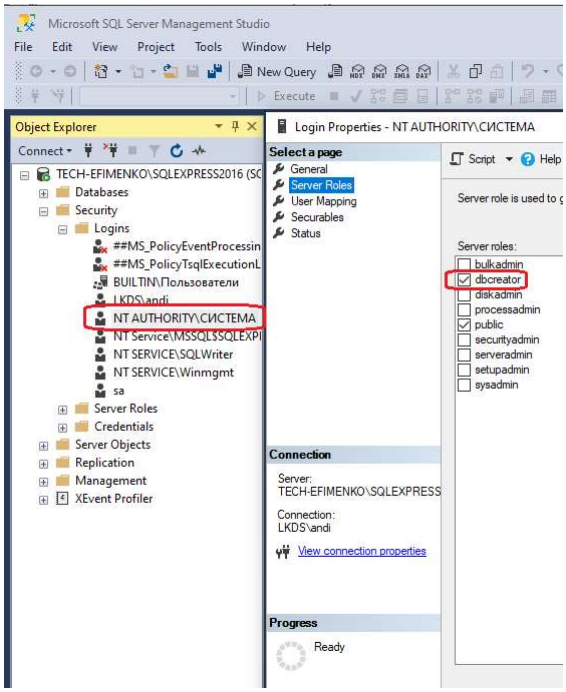


Press arrow button of the “Server name” field to select SQL server, select <Browse for more…> option, then expand “Database Engine” on tab «Local Servers»:

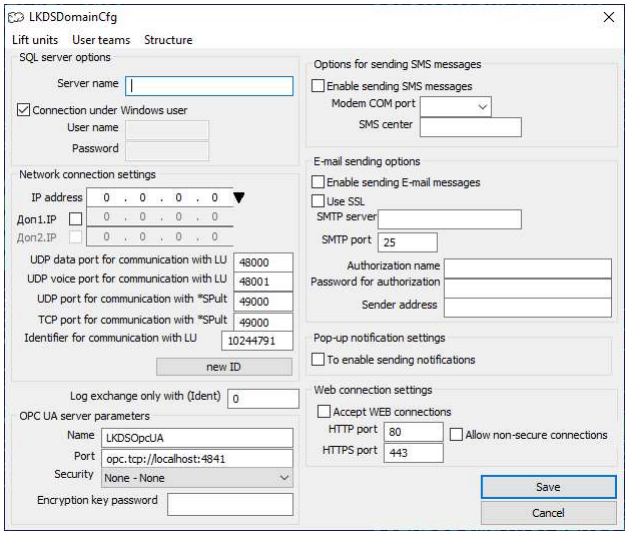


The name of SQL server will be used later for LKDSDomain setup.

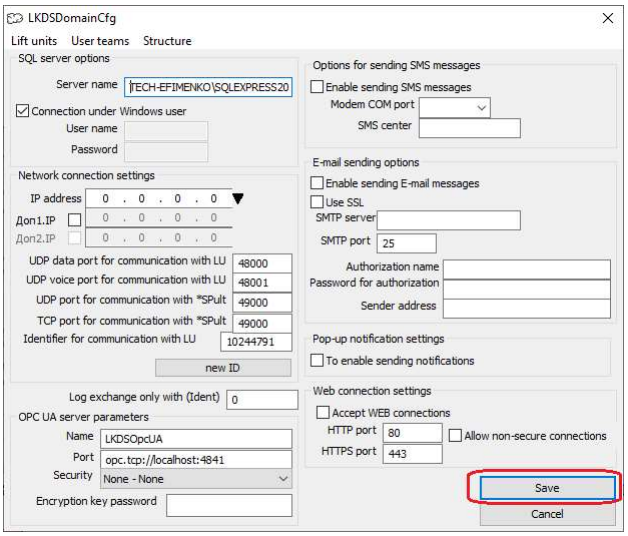
Perform settings of System user then:



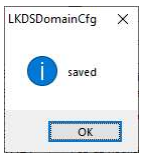
The initial LKDSDomain setup is made using LKDSDomainCfg.exe routine, that could be executed via menu: «LMDS» \ «Server dispatch LKDSDomain - setting (LKDSDomainCfg.exe)». The window below opens at the routine startup:



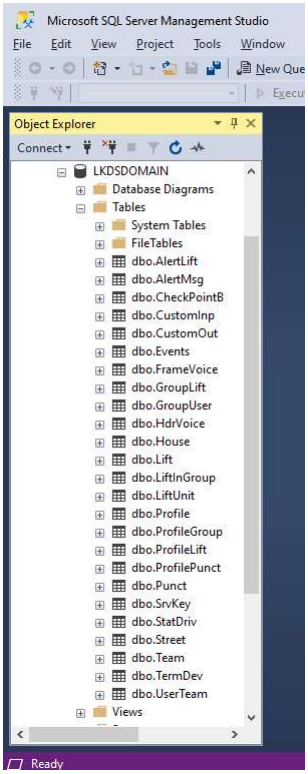
Enter SQL server name in Server Name field, then press Save button:



The message appears after successful saving:



And you can see the LKDSDOMAIN database:



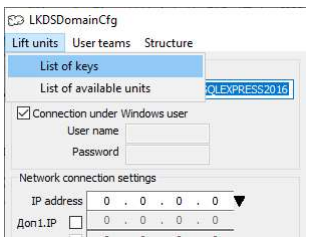
2. Adding LU 7.2 to LKDSDomain configuration

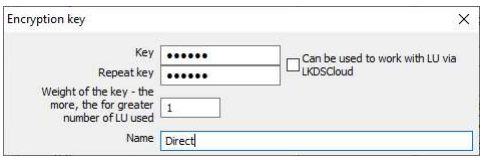
A Lift Unit 7.2 can be added to LKDSDomain configuration by either of two ways:

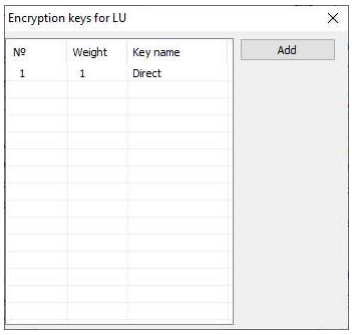
1.Assign a link to LKDSDomain. In this case the Lift Unit exchanges data with LKDSDomain directly using UDP port of LKDSDomain. We call it direct connection.

2.Assign the LKDSCloud service for the LKDSDomain and the Lift Unit data exchange. We call it transit via LKDSCloud.

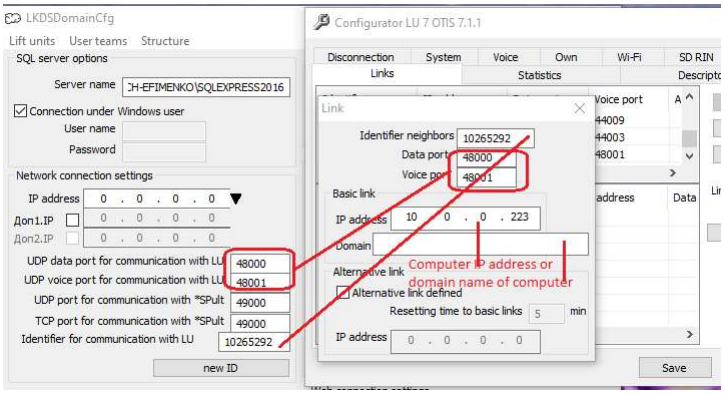
Using either of ways, first of all, one must enter the primary (encryption) key of the Lift Unit.



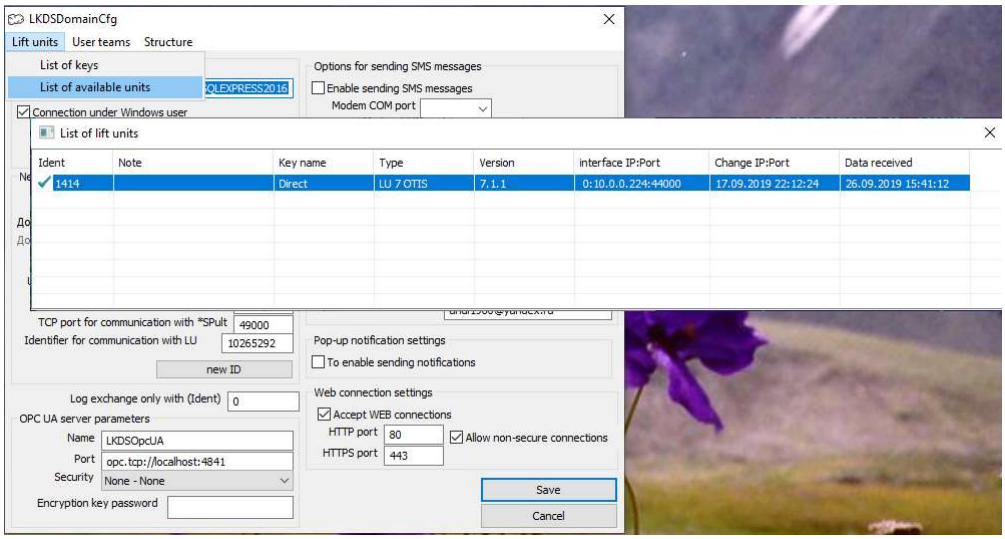




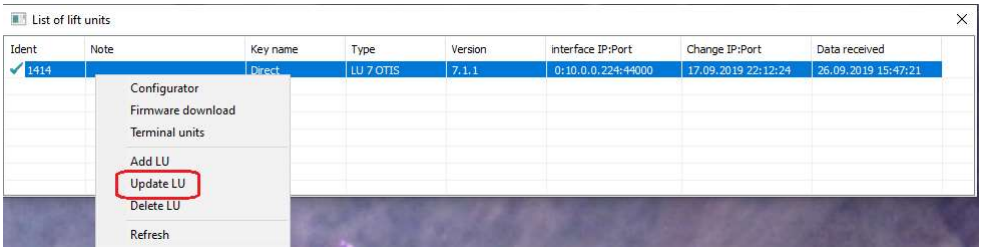
The link to LKDSDomain is assigned for the Lift Unit using ConfigLBPro.exe utility:

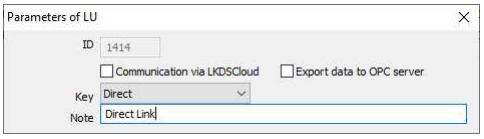


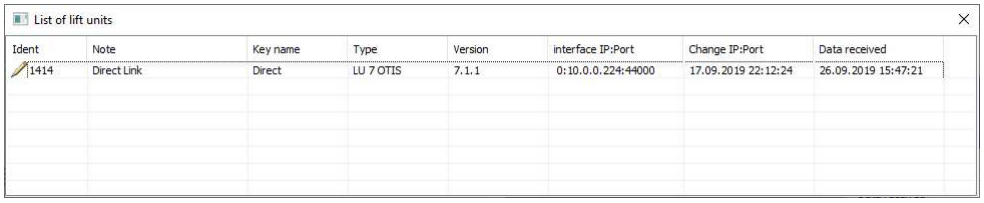
If communication between the Lift Unit and the LKDSDomain has been established, the Lift Unit appears in the list. Otherwise, firewall settings should be checked up (UDP port 48000 inbound available), The utility Wireshark can be used to make sure the UDP packets in port 48000 are received by network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



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

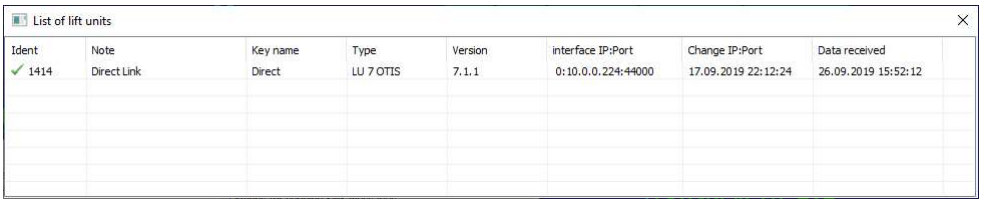




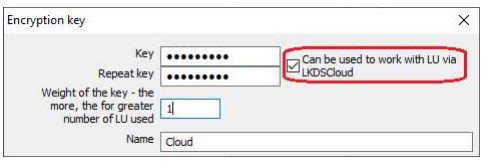


Exiting LKDSDomainCfg utility or pressing “Save” button results in the confirmation window opens:

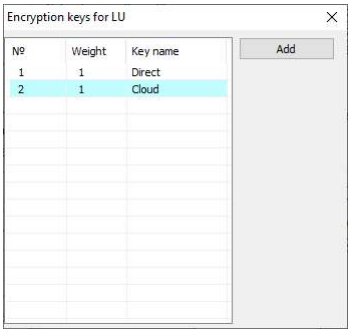
The comment will be saved after confirmation:



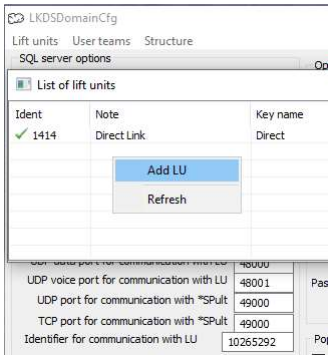
The encryption key should be entered for transit communication method. The checkbox “Can be used to work with LU via LKDSCloud” must be selected:



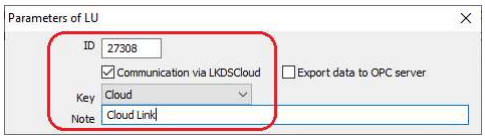
The Lift Unit that uses transit communication via LKDSCloud is highlighted cyan in the list:



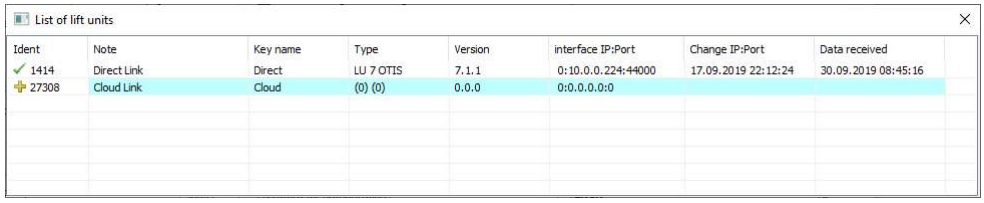
After entering encryption key, add the Lift Unit itself:



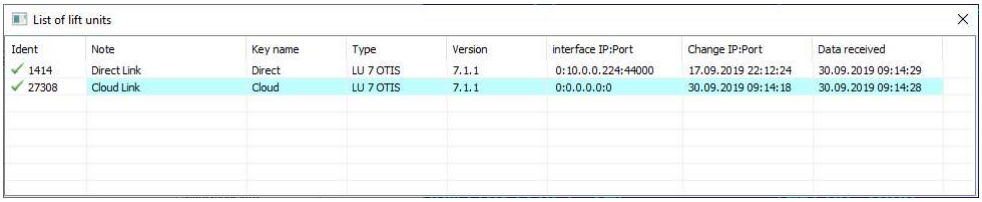
Enter Lift Unit ID, the encryption key and notes:



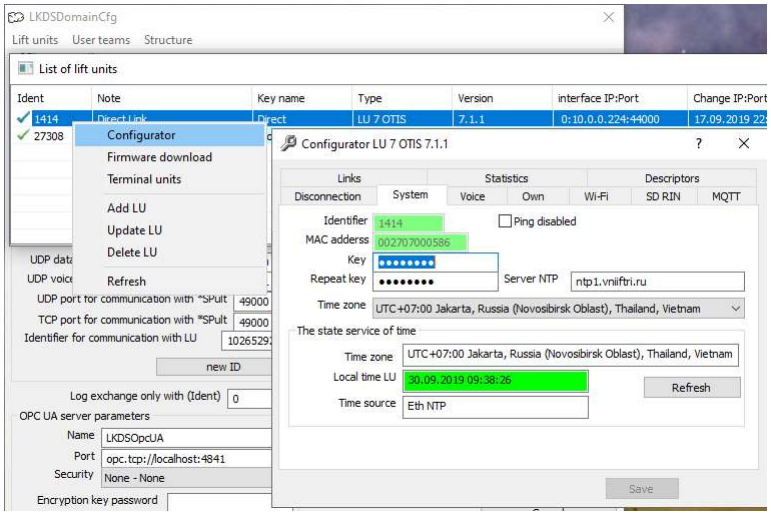
Using LKDSCloud, the encryption key and timezone should be added to the Lift Unit parameters.



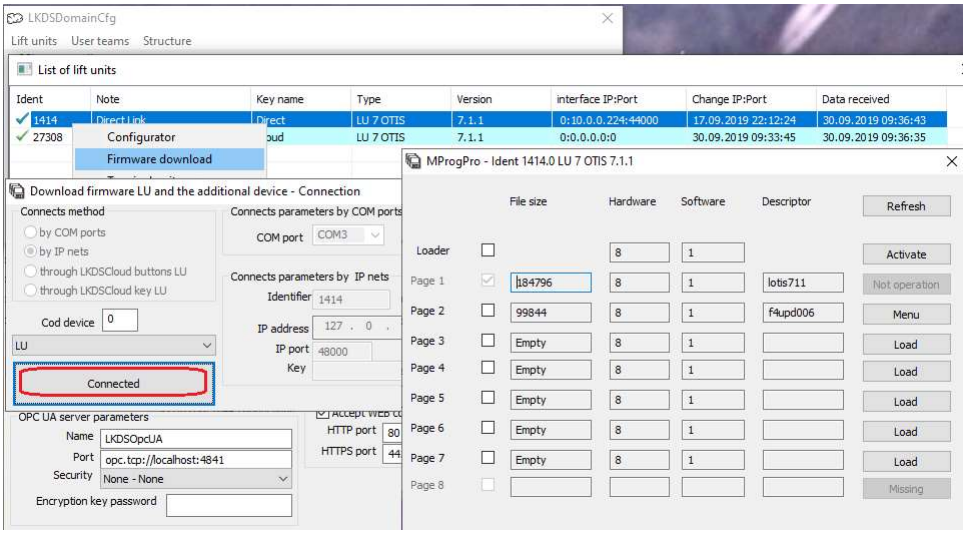
And all configuration parameters will be saved as well:



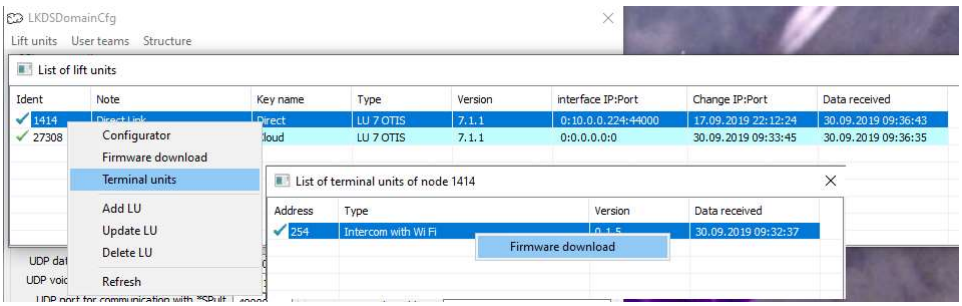
The Lift Unit configuration utility can also be invoked using context menu while browsing the list of the Lift Units:



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 LKDSDomain.

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

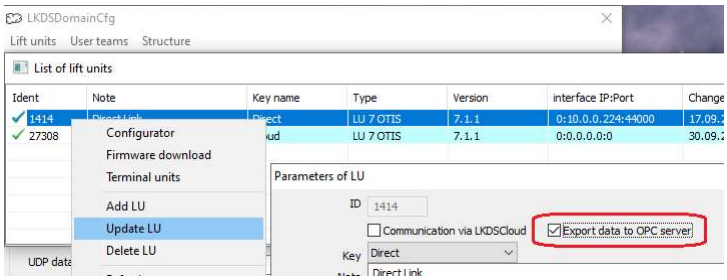
1.Using external SCADA systems.

2.Using built in LKDSDomain monitoring server and client’s applications.

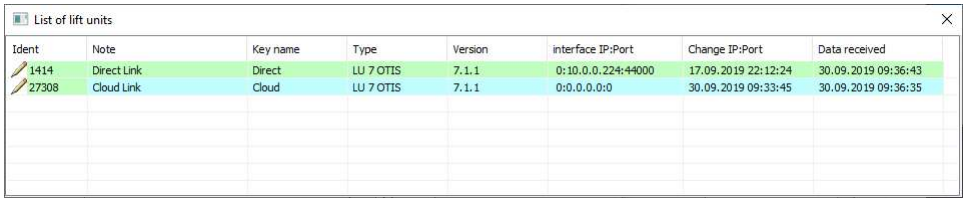
3.1. External SCADA systems.

Two open standard industrial protocols supported by LKDSDomain- 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:



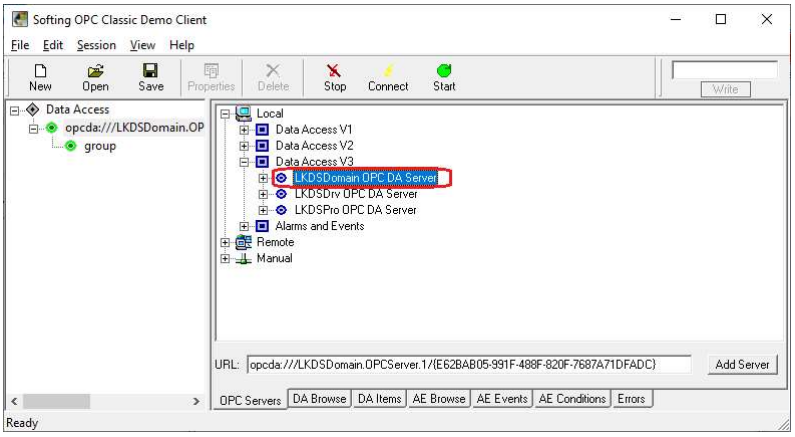
The list of exported variables:

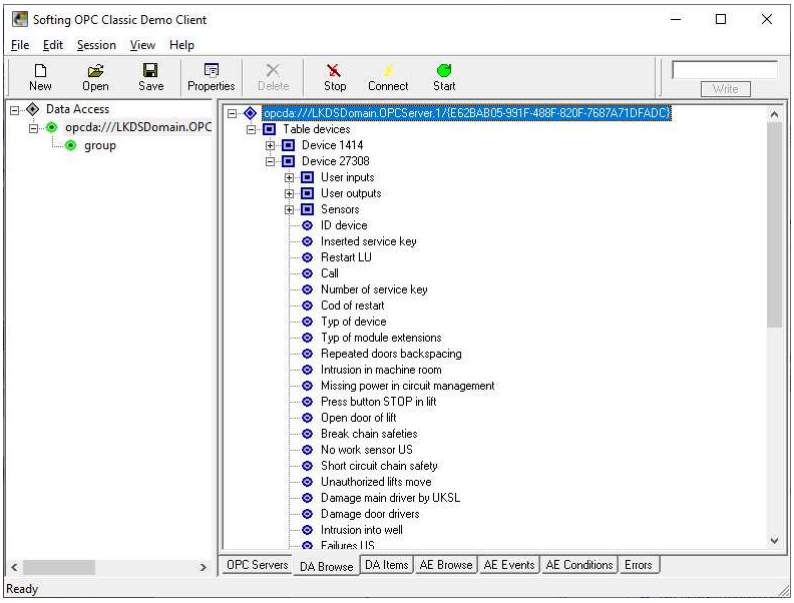
ID of item (ItemID)	**Name of item**
2.<ID_LU>.1	Identifier LU
2.<ID_LU>.100	Inserted service key
2.<ID_LU>.101	Restart LU
2.<ID_LU>.102	**Call**
2.<ID_LU>.104	Number of service key
2.<ID_LU>.105	Cod of restart
2.<ID_LU>.106	Typ of device
2.<ID_LU>.107	Typ of module extensions
2.<ID_LU>.301	Repeated 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

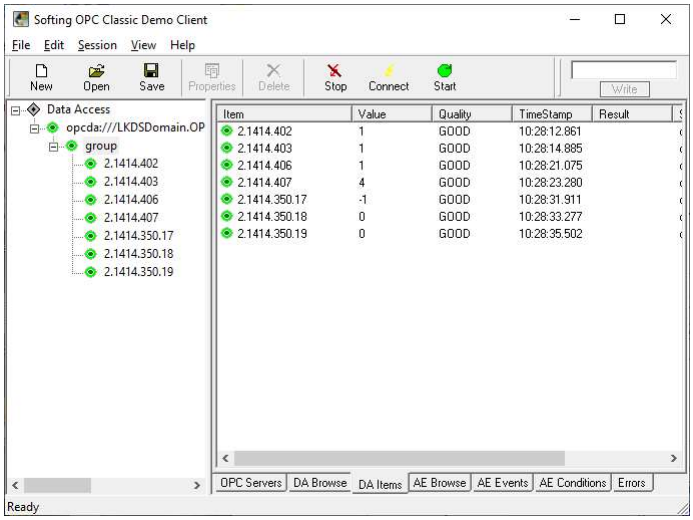
2.<ID_LU>.312	Intrusion into well
2.<ID_LU>.313	Failures US
2.<ID_LU>.314	**Emergency lock**
2.<ID_LU>.315	Open machine room
2.<ID_LU>.316	Lift between floors
2.<ID_LU>.317	No work sensor DC
2.<ID_LU>.318	Open doors well by US
2.<ID_LU>.319	Main driver turn on
2.<ID_LU>.320	User bit
2.<ID_LU>.321	Jumper 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:** • **0 - N/A** • **1 - in motion** • **2 - moving UP**

	• **3 - moving DOWN** • **4 - Not moving**
2.<ID_LU>.407	**Status doors of lift:** • **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

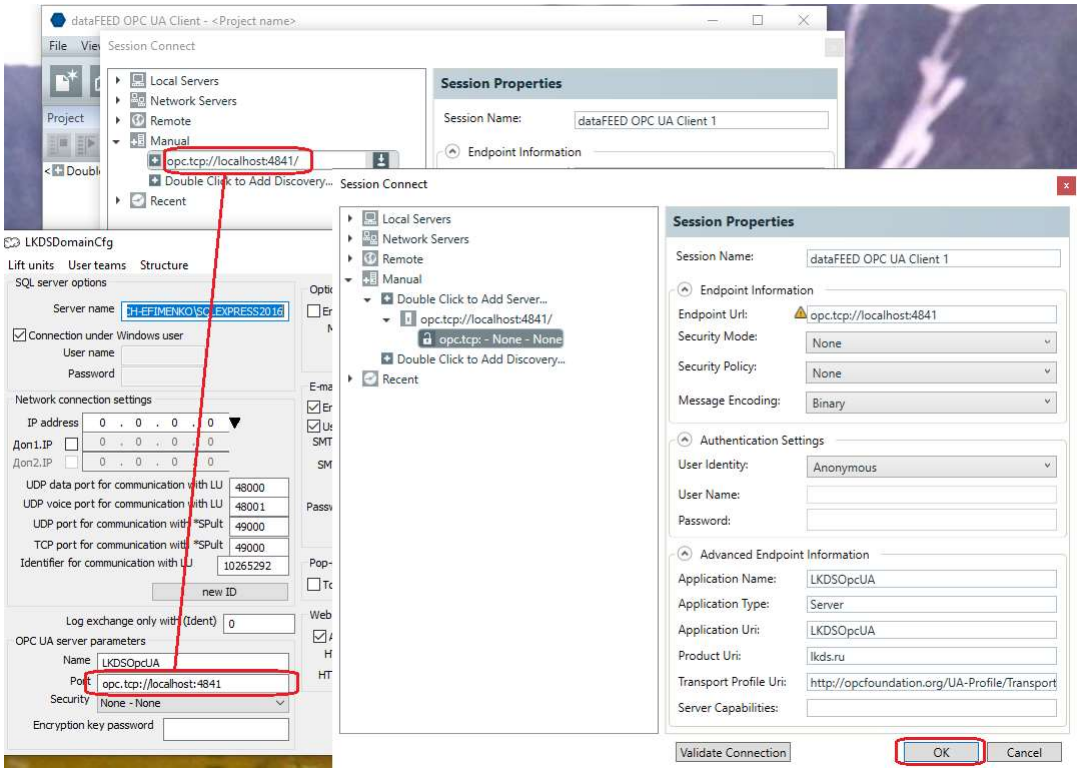
3.1.1 Examples of LKDSDomain OPC DA variables

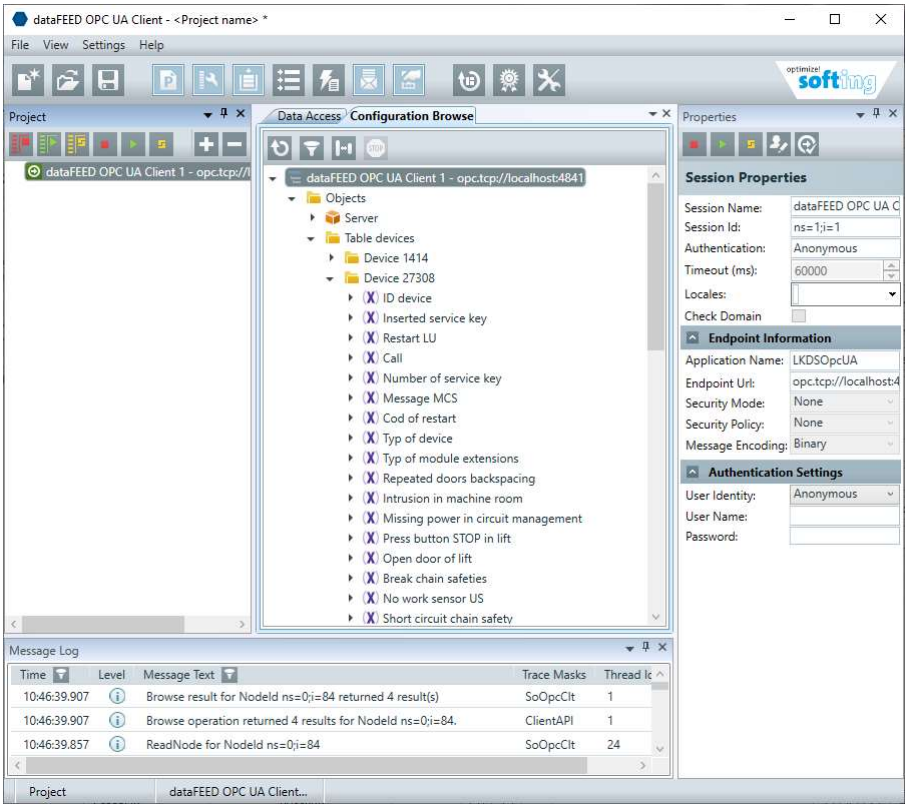


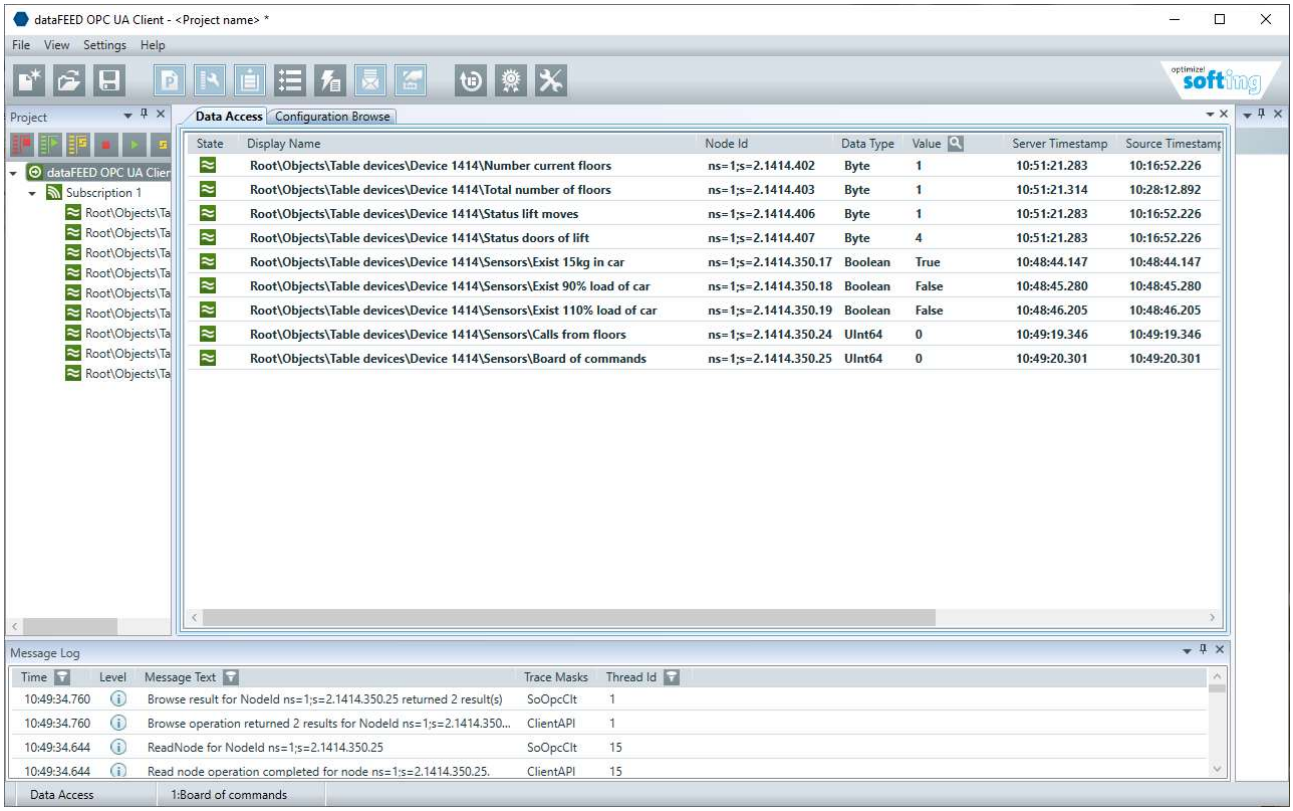




3.1.2 LKDSDomain server OPC UA. Viewing address range.




dataFEED OPC UA Client - <Project name> *
File View Settings Help
Project
dataFEED OPC UA Client 1 - opc.tcp://l
Data Access Configuration Browse
dataFEED OPC UA Client 1 - opc.tcp://localhost:4841
Objects
Server
Table devices
Device 1414
Device 27308
ID device
Inserted service key
Restart LU
Call
Number of service key
Message MCS
Cod of restart
Typ of device
Typ of module extensions
Repeated doors backspacing
Intrusion in machine room
Missing power in circuit management
Press button STOP in lift
Open door of lift
Break chain safeties
No work sensor US
Short circuit chain safety
Properties
Session Properties
Session Name: dataFEED OPC UA C
Session Id: ns=1;i=1
Authentication: Anonymous
Timeout (ms): 60000
Locales:
Check Domain
Endpoint Information
Application Name: LKDSOpcUA
Endpoint Url: opc.tcp://localhost:4
Security Mode: None
Security Policy: None
Message Encoding: Binary
Authentication Settings
User Identity: Anonymous
User Name:
Password:
Message Log
Time Level Message Text Trace Masks Thread Id
10:46:39.907 Browse result for NodeId ns=0;i=84 returned 4 result(s) SoOpcClt 1
10:46:39.907 Browse operation returned 4 results for NodeId ns=0;i=84. ClientAPI 1
10:46:39.857 ReadNode for NodeId ns=0;i=84 SoOpcClt 24
Project
dataFEED OPC UA Client...


dataFEED OPC UA Client - <Project name> *
File View Settings Help
Project
dataFEED OPC UA Clier
Subscription 1
Root\Objects\Ta
Data Access Configuration Browse
State Display Name Node Id Data Type Value Server Timestamp Source Timestamp
Root\Objects\Table devices\Device 1414\Number current floors ns=1;s=2.1414.402 Byte 1 10:51:21.283 10:16:52.226
Root\Objects\Table devices\Device 1414\Total number of floors ns=1;s=2.1414.403 Byte 1 10:51:21.314 10:28:12.892
Root\Objects\Table devices\Device 1414\Status lift moves ns=1;s=2.1414.406 Byte 1 10:51:21.283 10:16:52.226
Root\Objects\Table devices\Device 1414\Status doors of lift ns=1;s=2.1414.407 Byte 4 10:51:21.283 10:16:52.226
Root\Objects\Table devices\Device 1414\Sensors\Exist 15kg in car ns=1;s=2.1414.350.17 Boolean True 10:48:44.147 10:48:44.147
Root\Objects\Table devices\Device 1414\Sensors\Exist 90% load of car ns=1;s=2.1414.350.18 Boolean False 10:48:45.280 10:48:45.280
Root\Objects\Table devices\Device 1414\Sensors\Exist 110% load of car ns=1;s=2.1414.350.19 Boolean False 10:48:46.205 10:48:46.205
Root\Objects\Table devices\Device 1414\Sensors\Calls from floors ns=1;s=2.1414.350.24 UInt64 0 10:49:19.346 10:49:19.346
Root\Objects\Table devices\Device 1414\Sensors\Board of commands ns=1;s=2.1414.350.25 UInt64 0 10:49:20.301 10:49:20.301
Message Log
Time Level Message Text Trace Masks Thread Id
10:49:34.760 Browse result for NodeId ns=1;s=2.1414.350.25 returned 2 result(s) SoOpcClt 1
10:49:34.760 Browse operation returned 2 results for NodeId ns=1;s=2.1414.350... ClientAPI 1
10:49:34.644 ReadNode for NodeId ns=1;s=2.1414.350.25 SoOpcClt 15
10:49:34.644 Read node operation completed for node ns=1;s=2.1414.350.25. ClientAPI 15
Data Access
1:Board of commands

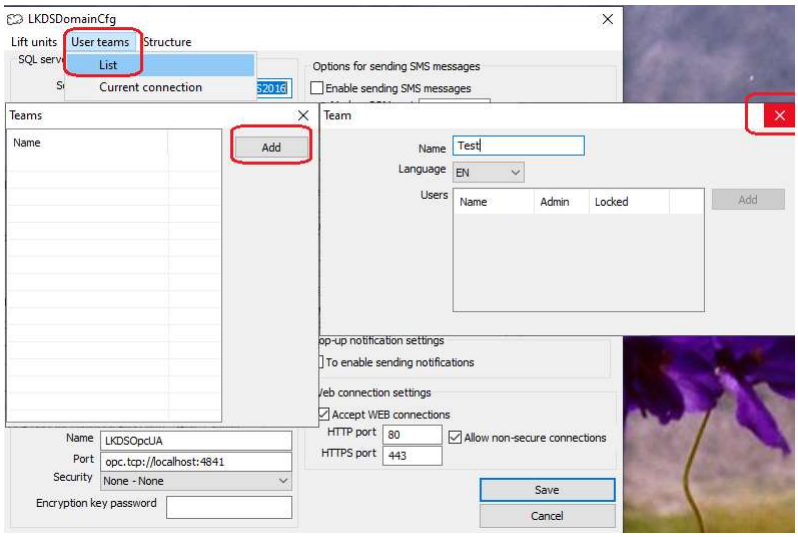
3.2 Use of built in monitoring server.

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.

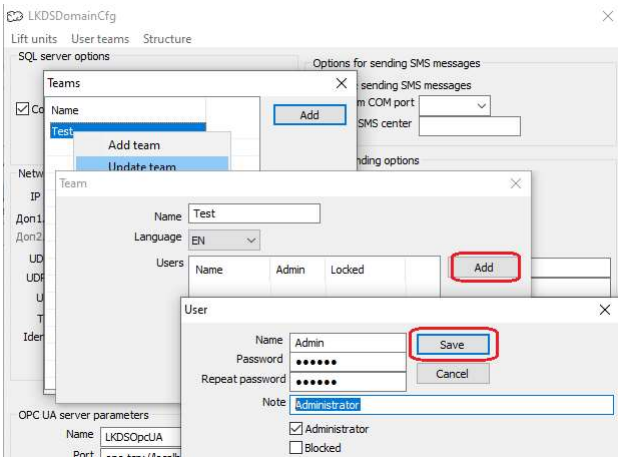
3.2.1. Registering a Team

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

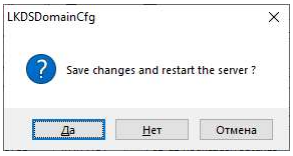
To register a Team “User teams” menu option is used. Select it and then press “Add” button.



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



After saving and confirmation, exit the LKDSDomainCfg routine:

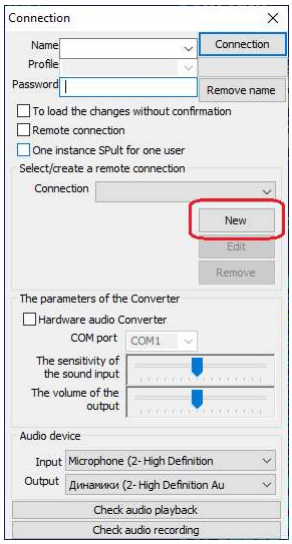


Execute “LMDS” \ “Client - server solution - Dispatching lifts (SPult.exe)” to make further steps on customizing your Team.

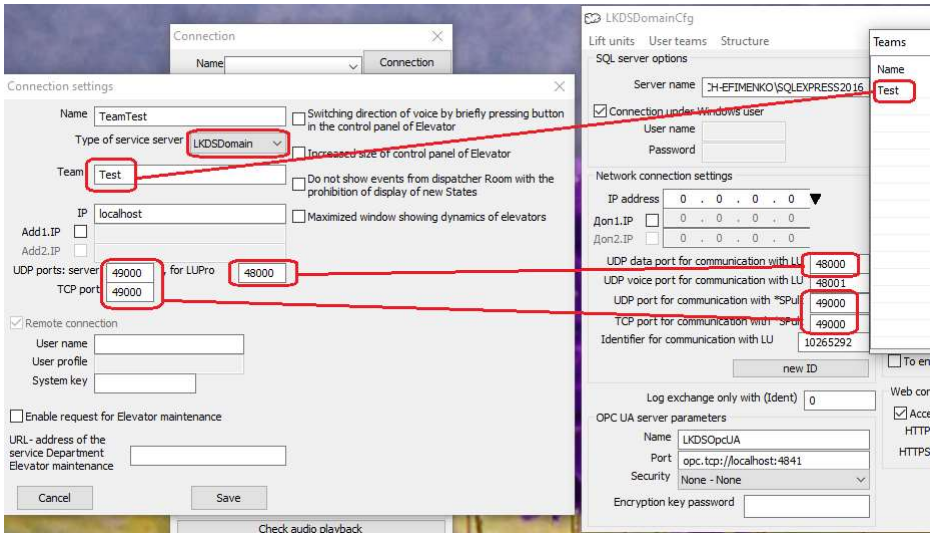
3.2.2. Customizing a Team.

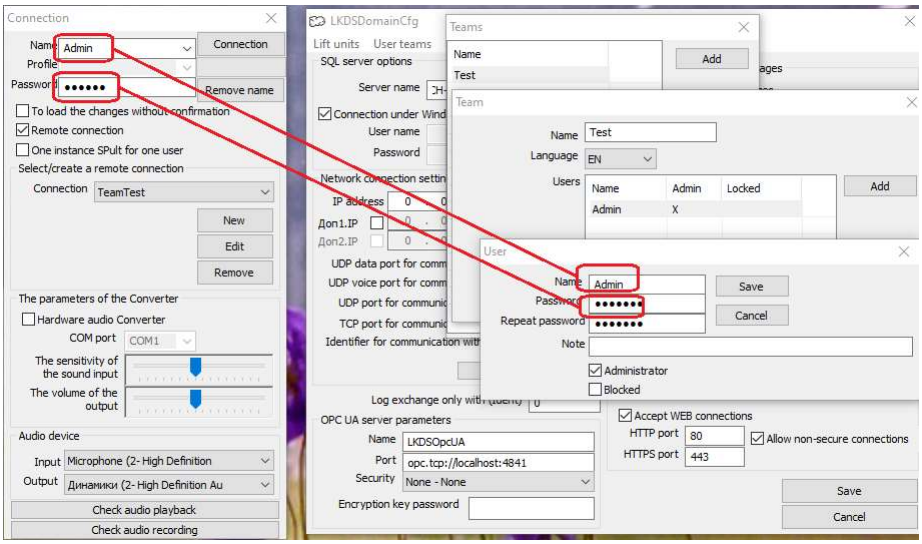
Execute SPult utility and login as the Administrator.

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



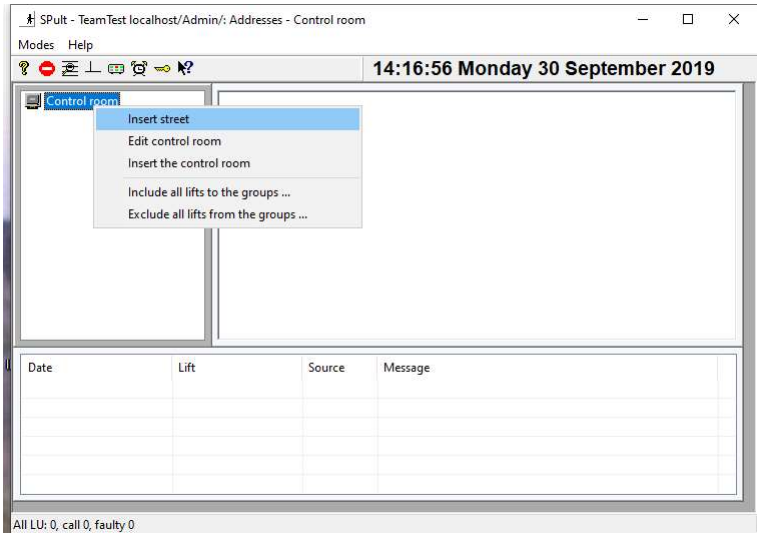
And enter the values as shown:

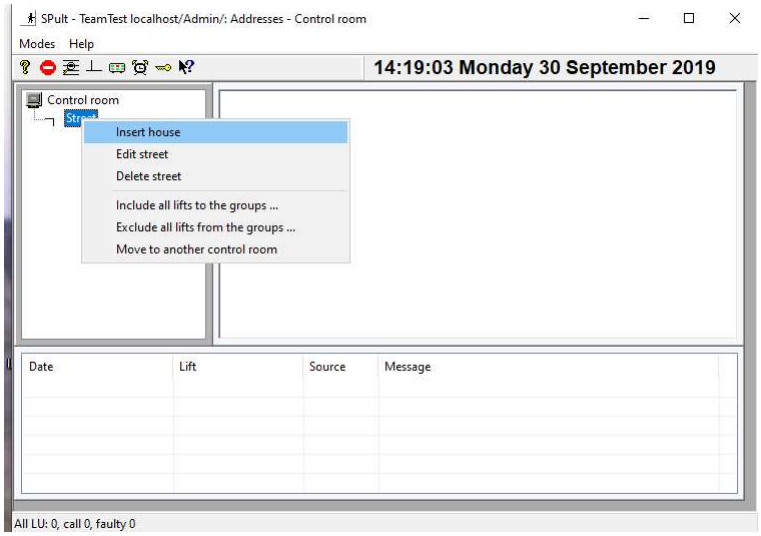


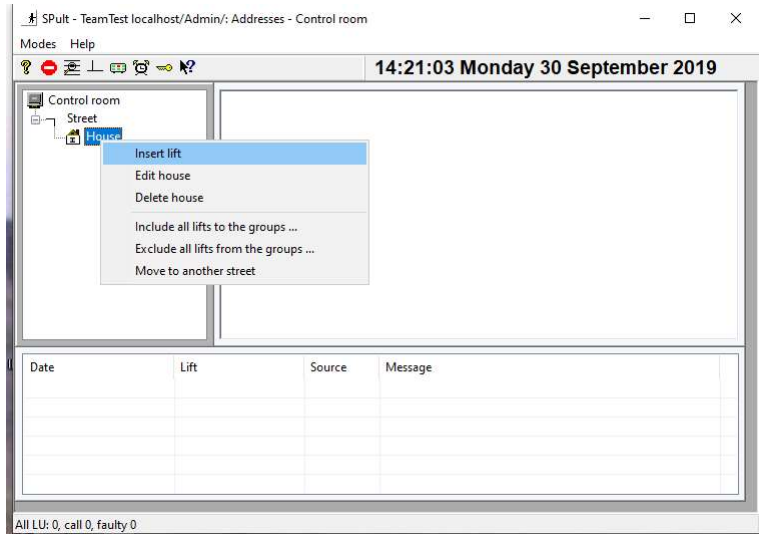


Press “Save” button and the window closes. Now enter the credentials of the administrator, then press «Connection» button:

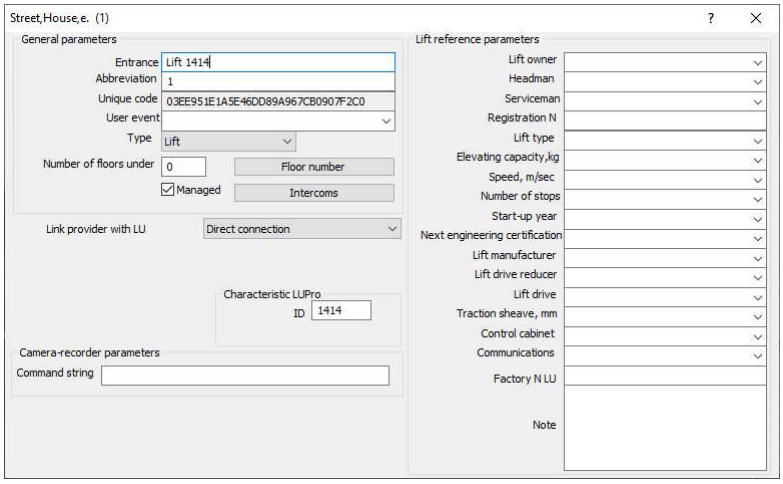
If connection is established, the window shown below appears. Left window is meant for inserting lifts for monitoring:



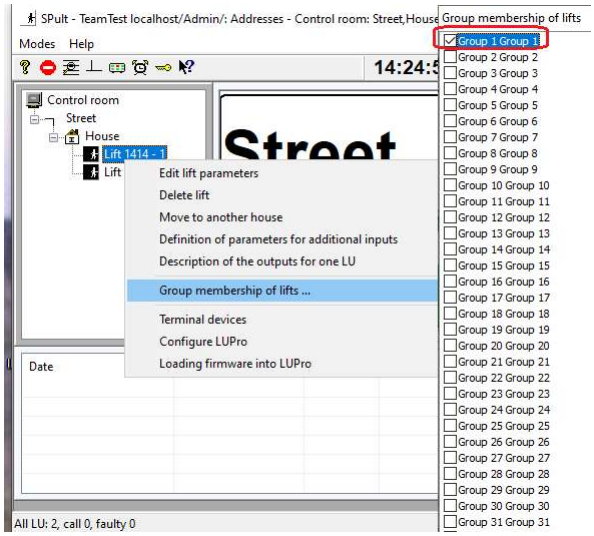




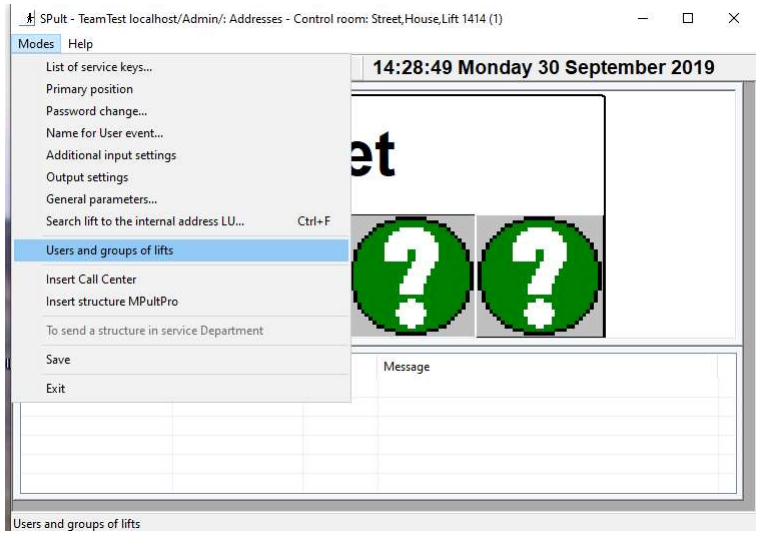
It is important to enter Lift Unit ID correctly:

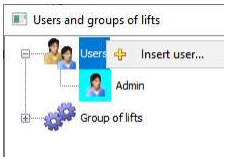


It is more convenient to grant access rights on a group of lifts, instead of on a specific lift. Each Team can have at most 31 groups of lifts. A lift can be a member of several groups:

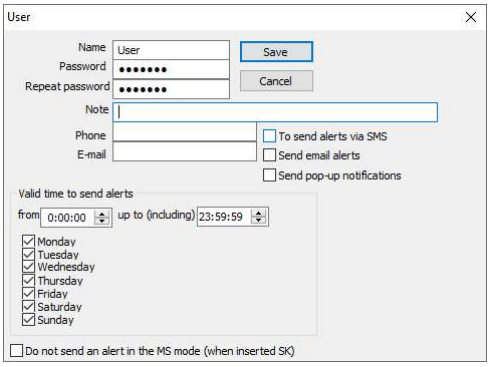


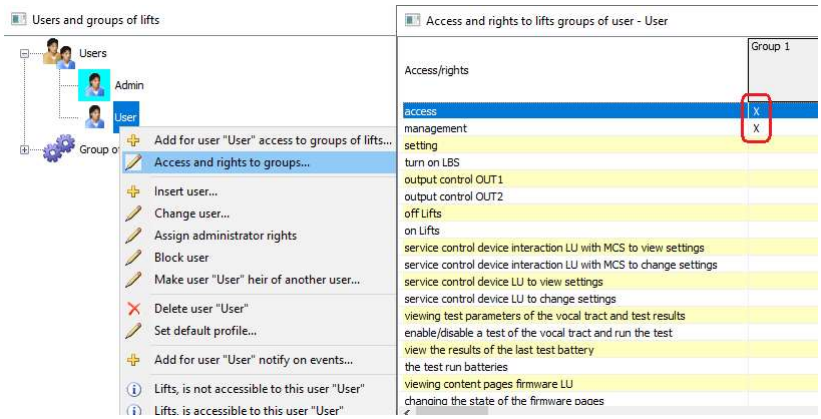
Insert as many operators (users in charge of monitoring) as necessary, then grant them necessary rights on certain groups of lifts:

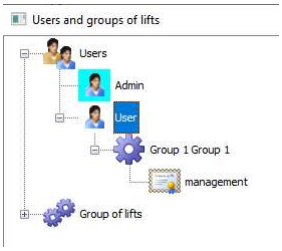




Any user must have login and password, as well as some additional parameters that allow to send messages to the user in accordance with changes of status.

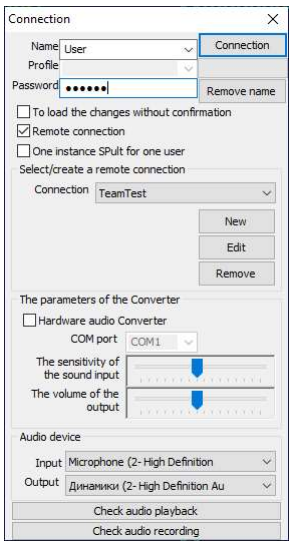




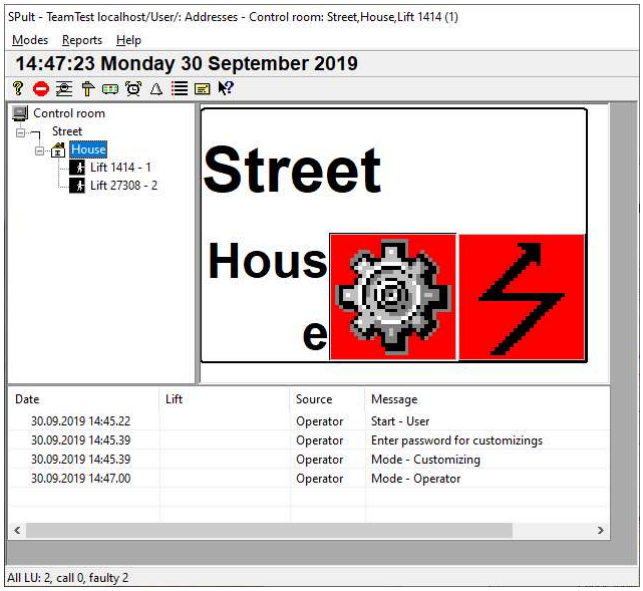


3.2.3. Monitoring using SPult.

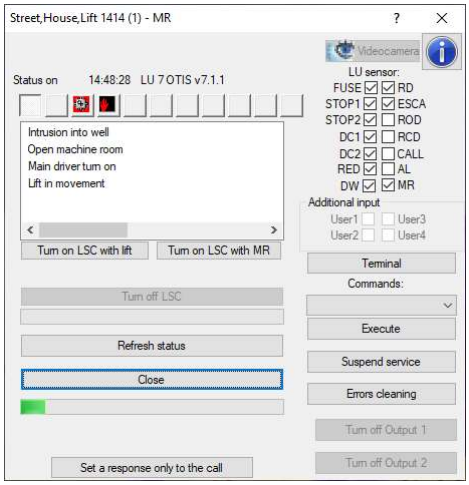
When steps above are made, it is possible to login under operator’s account and start monitoring.



After connection is established the window below opens:

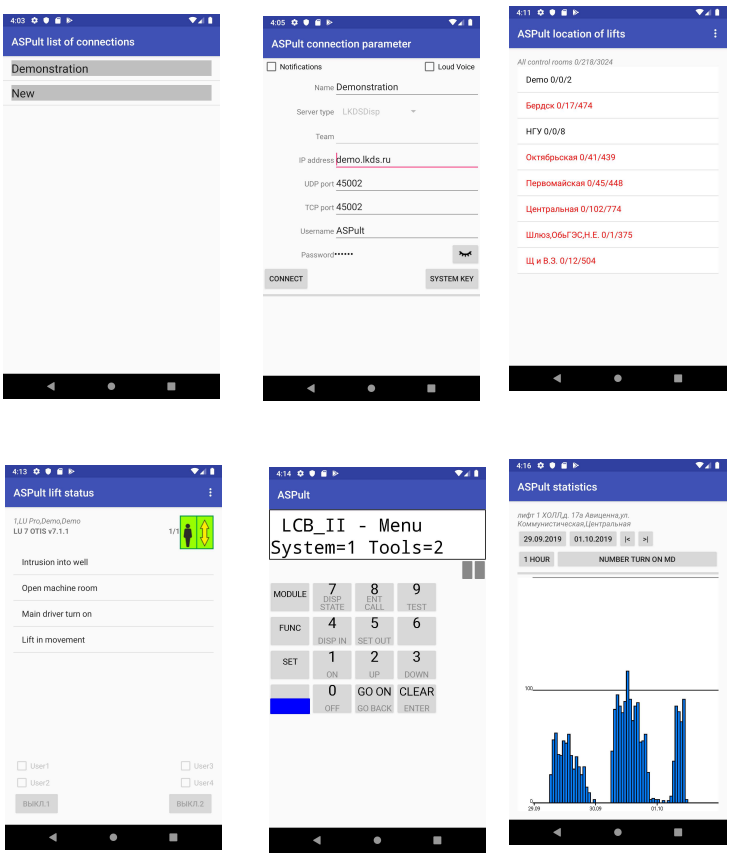


Double click the lift pictogram to open window with detailed information on the lift:



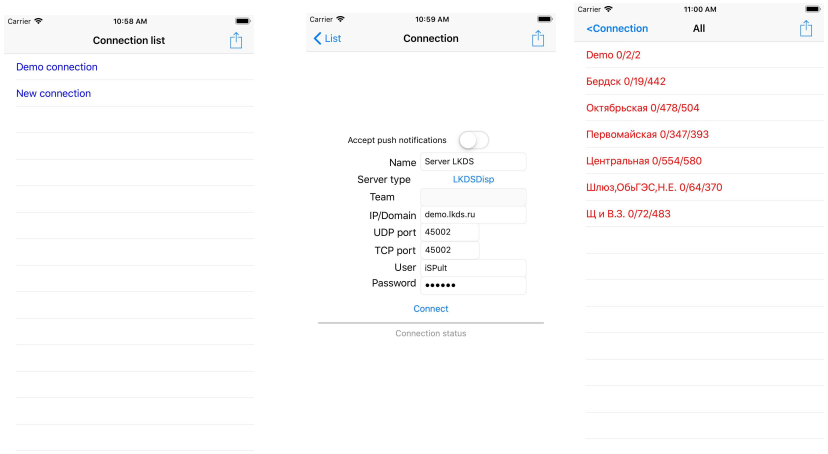
3.2.4. Monitoring using ASPult .

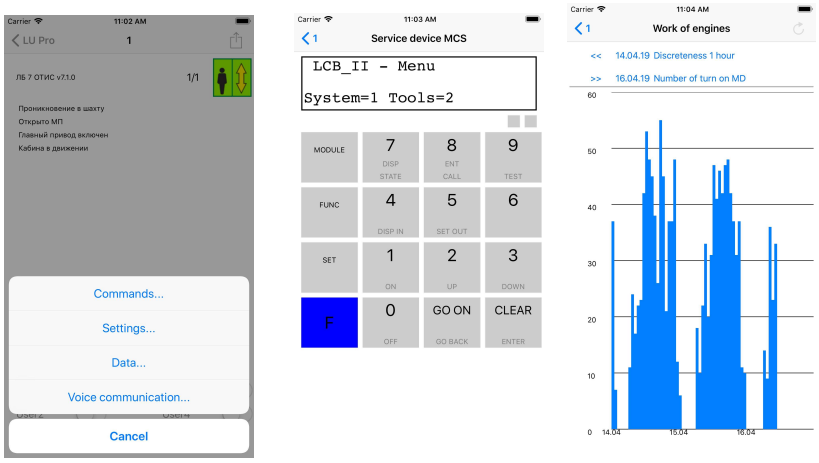
Use the link https://play.google.com/store/apps/details?id=lkds.aspult in Play Market to download free ASPult application. With this application you can monitor your lifts from your tablet PC or smartphone with Android operation system installed.



3.2.5. Monitoring using iSPult.

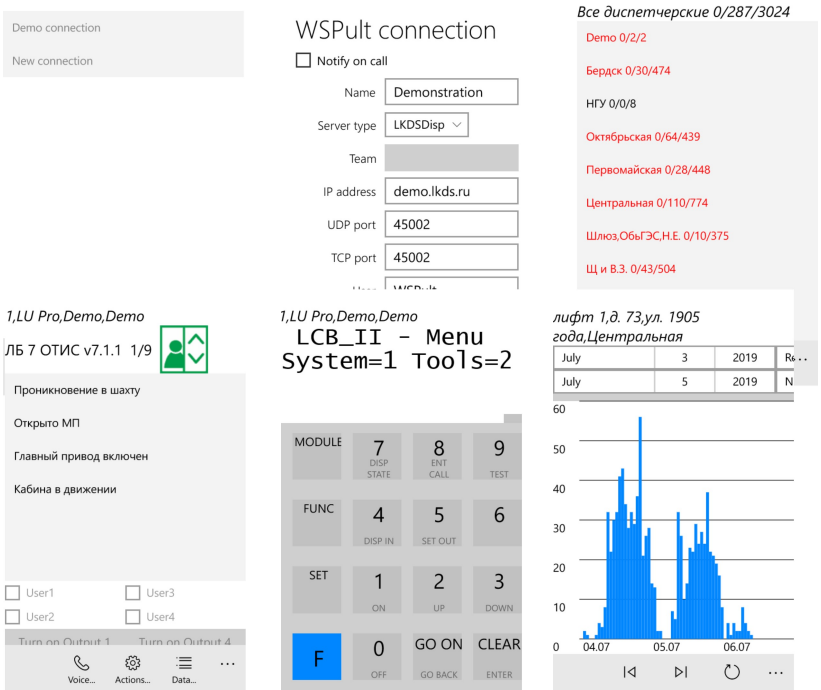
Use the link https://apps.apple.com/us/app/ispult/id979453148?l=en&ls=1 in AppStore to download free iSPult application. With this application you can monitor your lifts from your tablet PC or smartphone with iOS operation system installed.





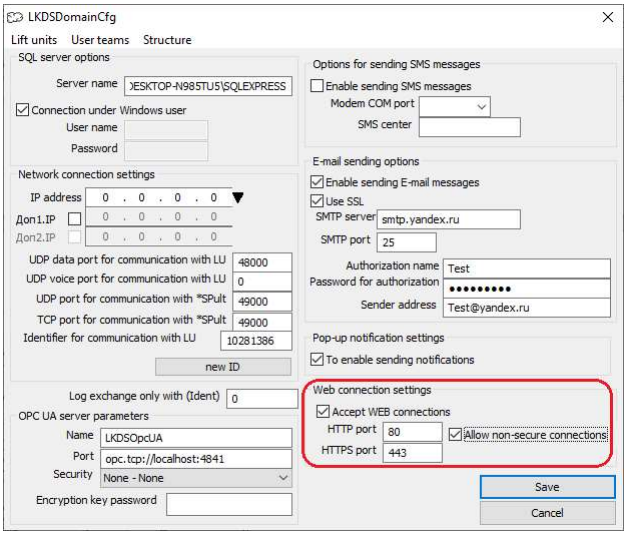
3.2.6. Monitoring using WSPult.

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.

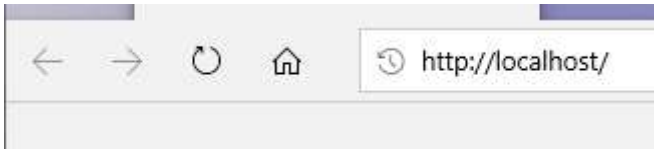


3.2.7. Using built in WEB interface.

Make built in WEB interface available:



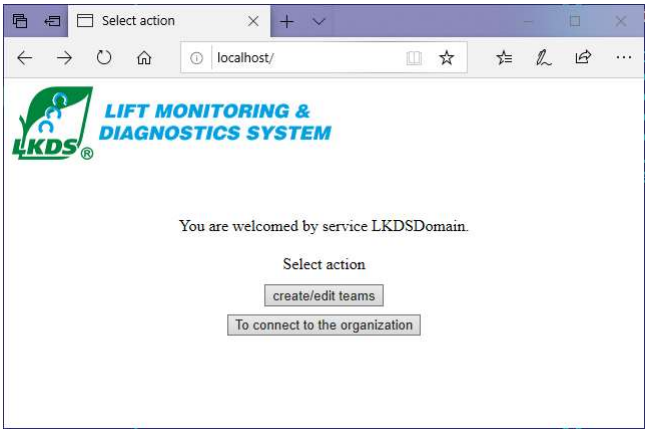
And connect to LKDSDomain:



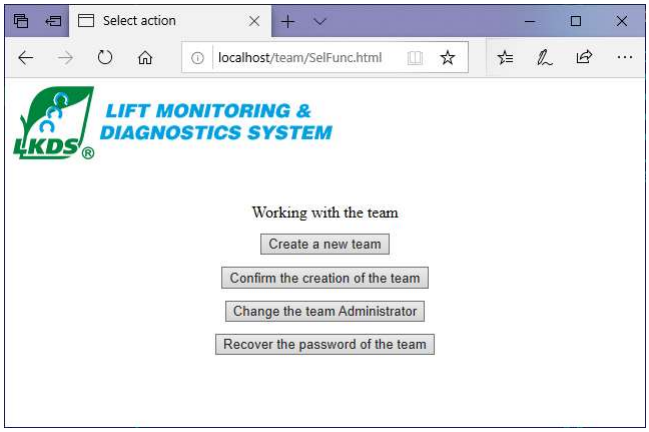
Two features are available:

1.Remote Team creation.

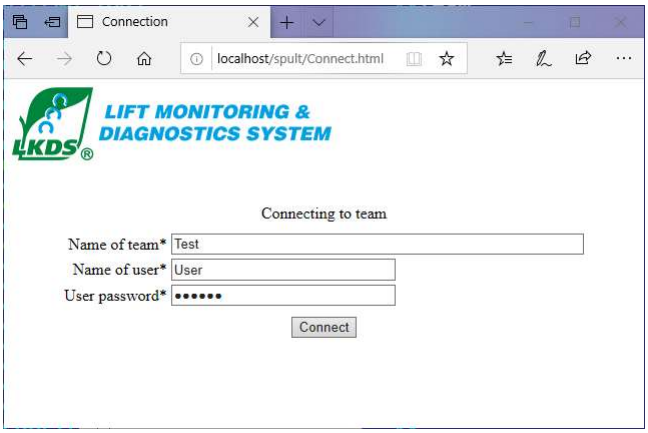
2.Monitoring lifts of your Team.

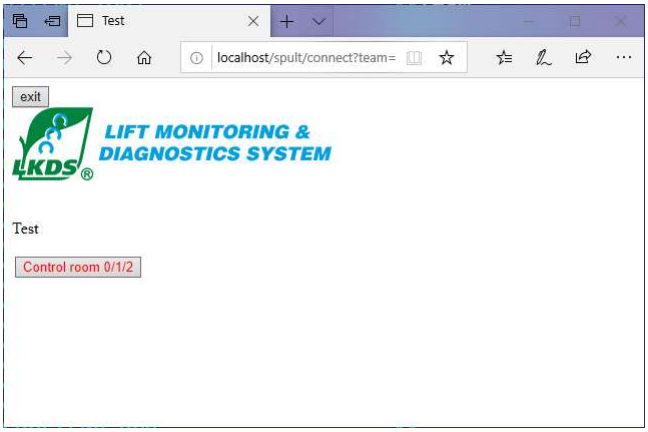


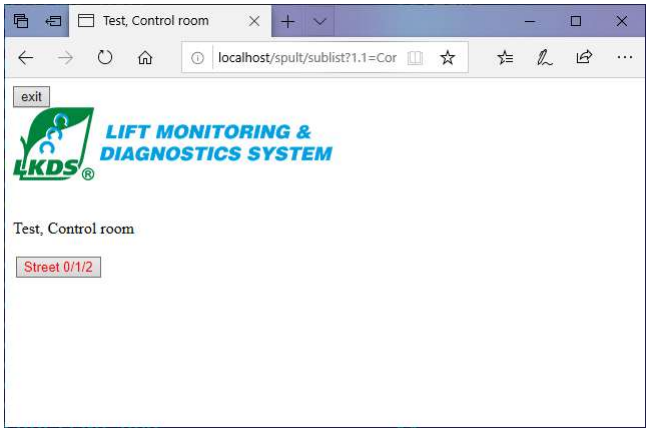
Interface for Remote Team creation looks like below:

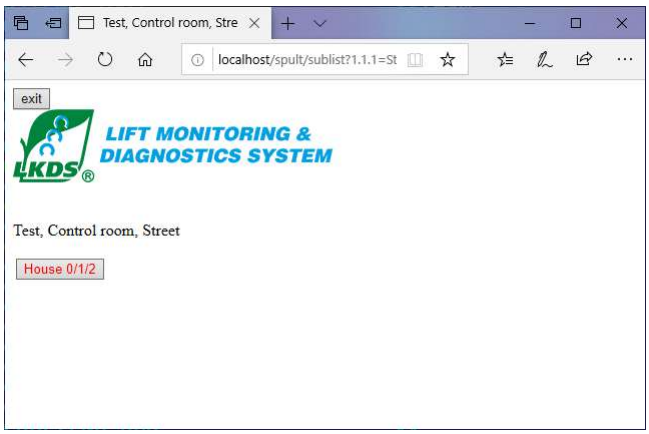


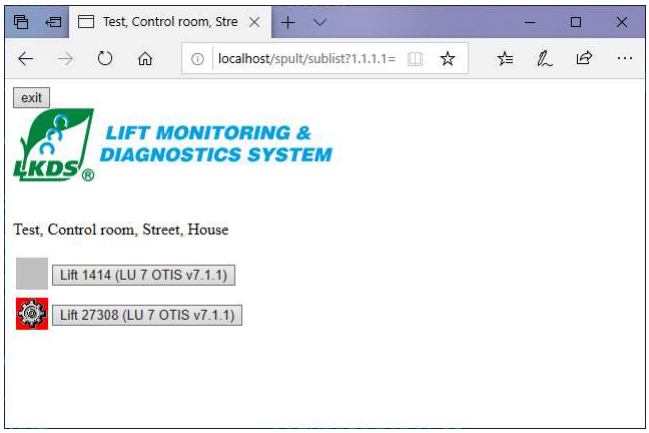
To make a connection to your lifts:

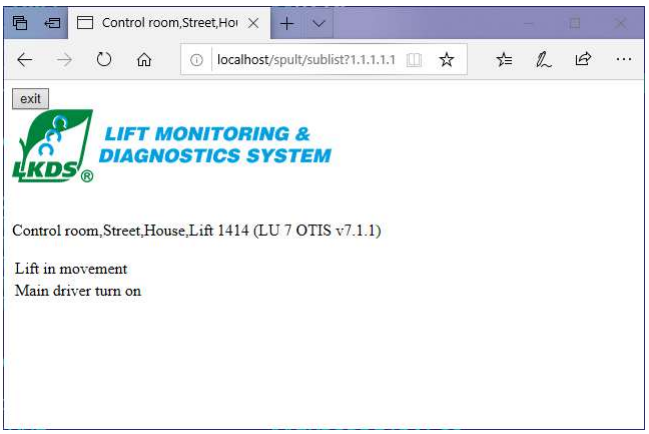





Test, Control room
localhost/spult/sublist?1.1=Cor
exit
LIFT MONITORING &
DIAGNOSTICS SYSTEM
Test, Control room
Street 0/1/2


Test, Control room, Stre
localhost/spult/sublist?1.1.1=St
exit
LIFT MONITORING &
DIAGNOSTICS SYSTEM
Test, Control room, Street
House 0/1/2


Test, Control room, Stre
localhost/spult/sublist?1.1.1.1=
exit
LIFT MONITORING &
DIAGNOSTICS SYSTEM
Test, Control room, Street, House
Lift 1414 (LU 7 OTIS v7.1.1)
Lift 27308 (LU 7 OTIS v7.1.1)



3.2.8. SMS and Email alerting.

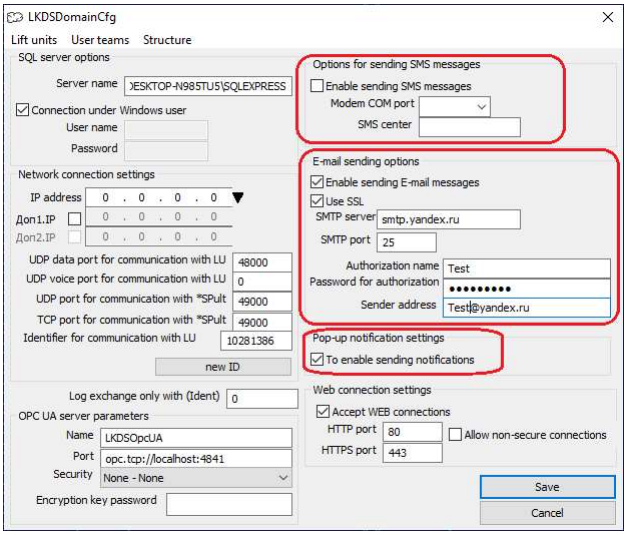
LKDSDomain can alert you using:

1.SMS messages

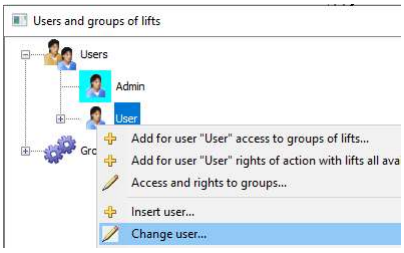
2.Email messages

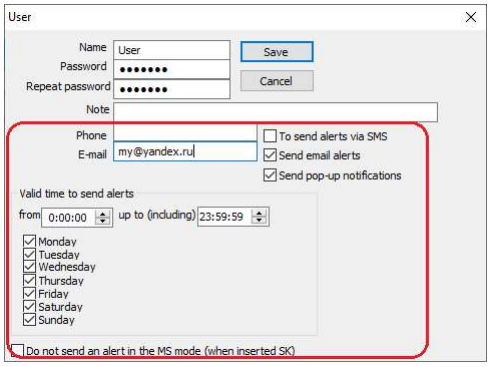
3.Push notification for ASPult and iSPult applications.

Fill in the following fields in LKDSDomainCfg routine:

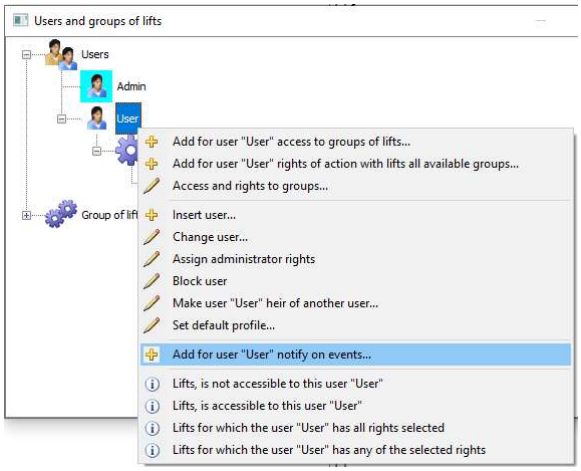


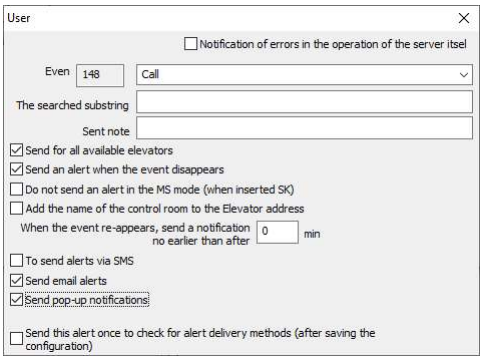
Then, login as Administrator in SPult to grant users the right to receive messages, also enter Email addresses and mobile numbers of users.:

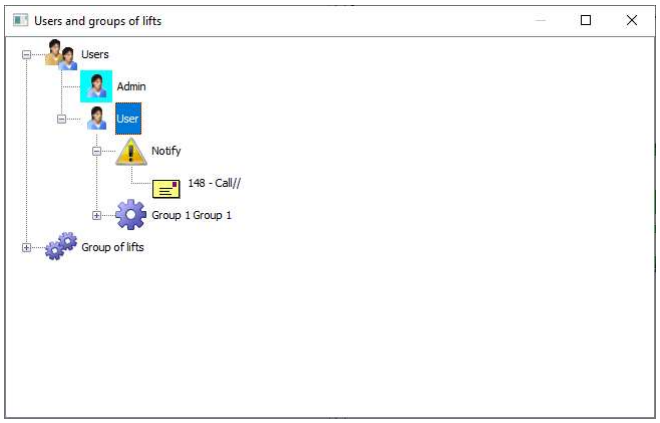




You can also specify the messages that will be sent to a user:







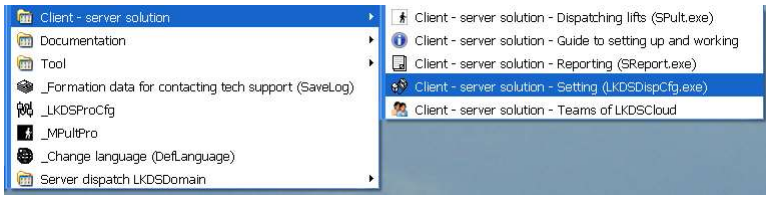
4. Migrating the structure from the LKDSDisp server to the LKDSDomain server.

LKDSDomain application server is a further development of LKDSDisp application server.
LKDSDomain application server fully implements the capabilities of LKDSDisp application server and provides new features.
LKDSDomain application server and the LKDSDisp application server can both run on the same computer and use the same MS SQL server.
LKDSDomain 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.

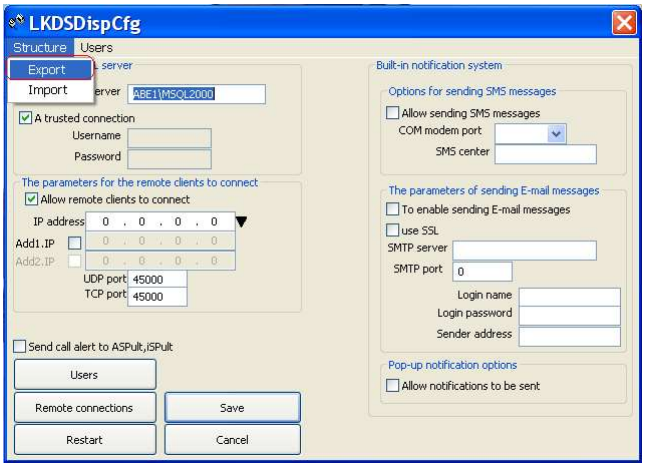
To learn LKDSDomain, there is a simple procedure to migrate the structure from LKDSDisp.

4.1. Unloading the structure from LKDSDisp.

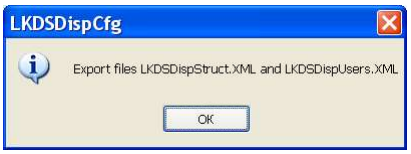
In LKDSDispCfg application:



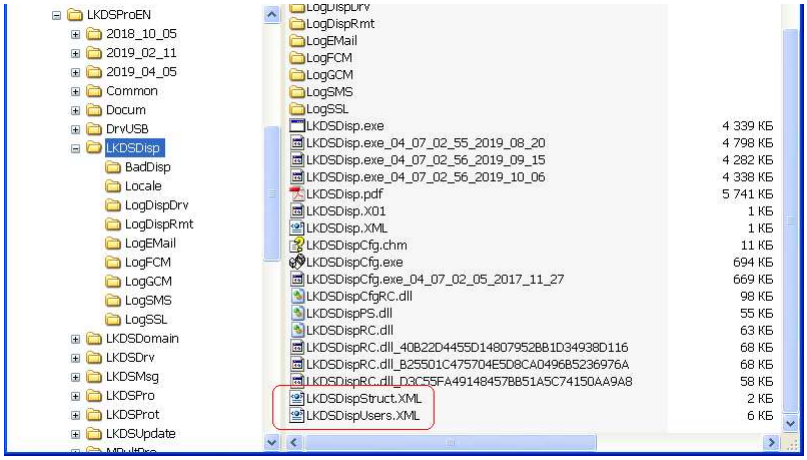
You need to select a menu item "Structure" \ "Export":



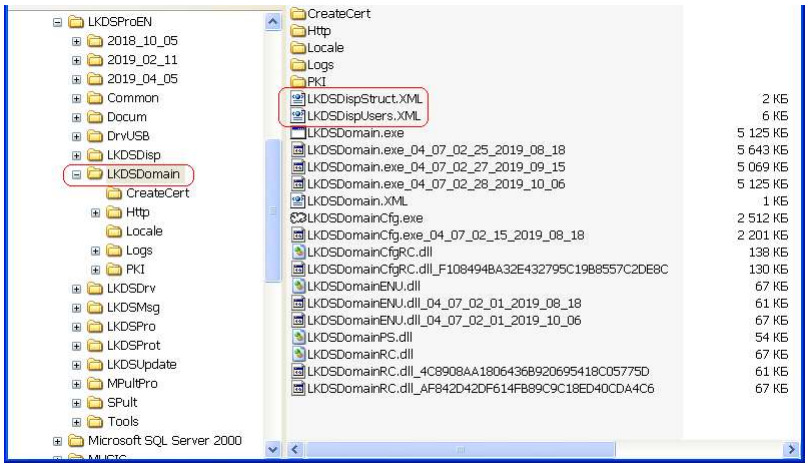
If the export is successful, a message will appear:



The files are in folder \LKDSProEN\LKDSDisp\:



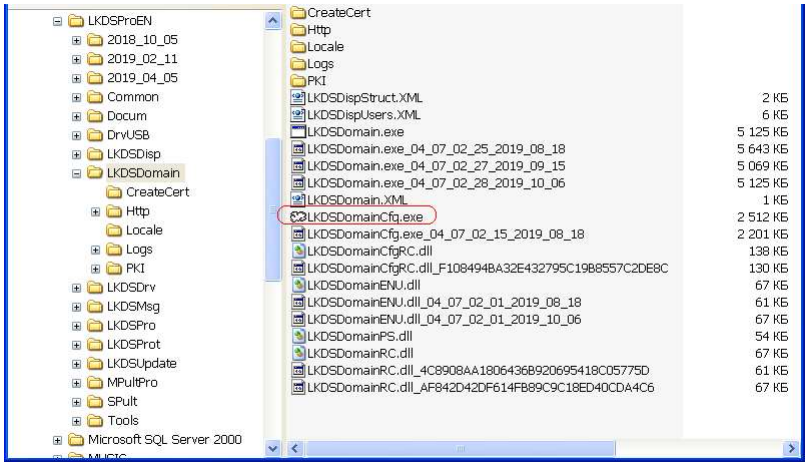
Copy the files to the folder \LKDSProEN\LKDSDomain\:



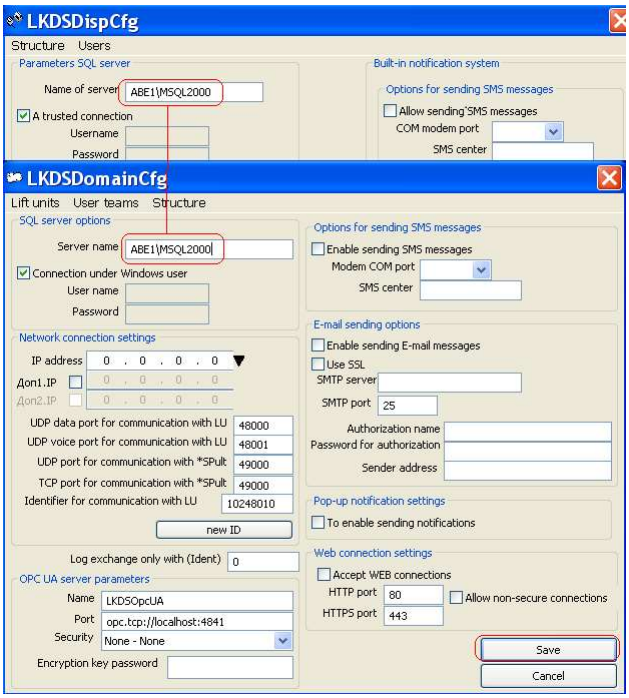
4.2. Import structure into LKDSDomain

Run the LKDSDomainCfg application:

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

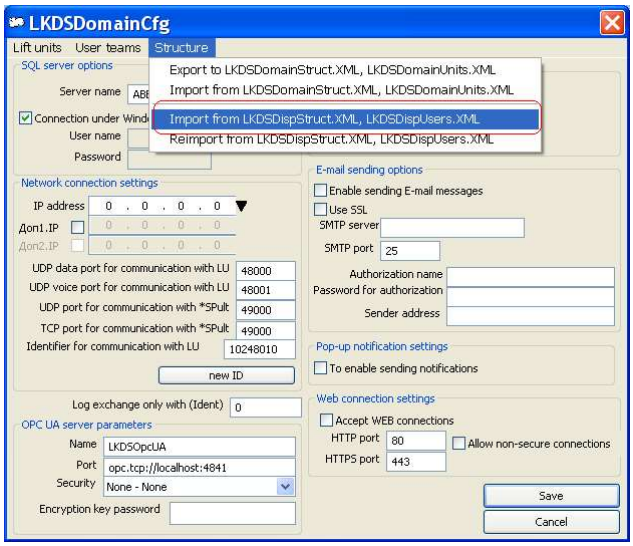


In the "Name of server" field, enter the same value as in the "Name of server" field of LKDSDispCfg and save:

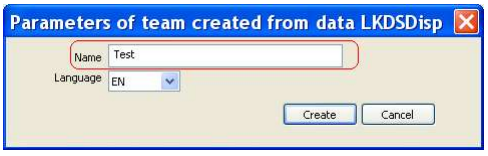


If the save is successful, a message will appear:

Then run LKDSDomainCfg again and select the menu item «Structure» \ “Import from LKDSDispStruct.xml, LKDSDispUsers.xml”:



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

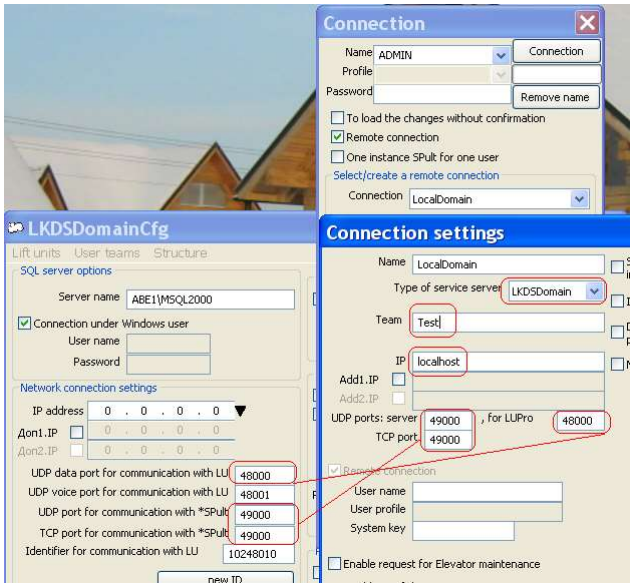


If the import is successful, a message will appear:

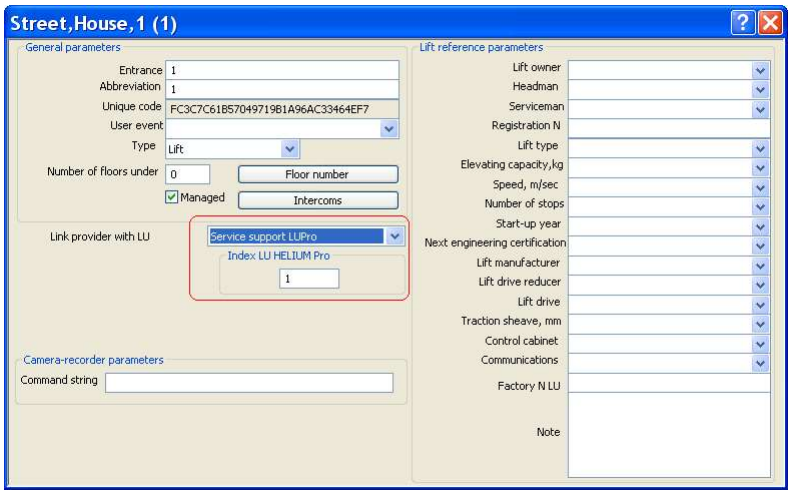
After import, you can connect to LKDSDomain using SPult, ASPult, iSPult, WSPult.

4.3. Connect to LKDSDomain from SPult.

SPult is connected to LKDSDomain only remotely. Even if SPult and LKDSDomain 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: