

Instruction manual of lite version of the program "Multilingual local instrumental system of expenses optimization, version 1.3" (LVP MLIS EO 1.3)

Installing LVP MLIS EO 1.3

1. Copy to a separate folder of your computer disk space a set of files of LVP MLIS EO 1.3.
2. Check the composition of this set, which should include the following files:
 - boot file **Lite_MLIS_EO.exe** of the program;
 - boot file **GLS.exe** of the utility program of version 1.0 under the name "Генератор языковых оболочек (ГЯО 1.0) (Generator of language shells (GLS 1.0))", which allows to create language shells for LVP MLIS EO 1.3 interface;
 - contents of the folder **Data** — data files with extension "dat" for several already solved demonstration tasks, next to which will be placed data files for tasks to be solved by the user;

Note

The installation set of LVP MLIS EO 1.3 includes five solved demonstration tasks, not available for removal, which are presented in two options: *Russian* ("DEMR01", "DEMR02", "DEMR03", "DEMR04", "DEMR05") and *English* ("DEME01", "DEME02", "DEME03", "DEME04", "DEME05"). Input and output data of these tasks you can look through on the screen, as well as bring out to Excel-files or print.

- contents of the folder **Dbscs** — files of databases of sale objects (DBSO), which are of two types: unlimited and limited (in the first of them the numbers of sale objects available for purchase are not specified, and in the second — are specified). File of the DBSO of unlimited (limited) type has the following name: **<three-digit code of database>inf(fin)_dbscs_<three-digit code of language of the current program shell>.dat**;

Note

The installation set of LVP MLIS EO 1.3 includes files of five test DBSO, which are presented in two options: *Russian* and *English*. Available for work becimed such group of these files, which language is the same as the selected language of the program interface.

- contents of the folder **Excel documents** — files of table format Excel (with ex-

tension "xls"), in which can be stored input data of any existing tasks and output data of solved tasks (subfolder **Tasks** with nested folders **Rus** and **Eng**), as well as contents of databases of sale objects (subfolder **Databases** with nested folders **Rus** and **Eng**);

Note

The installation set of LVP MLIS EO 1.3 includes Excel-files with input data of five demonstration tasks (in Russian and English options), as well as similar files of five test DBSO (in the same two options). These files, as well as any others with input data of tasks you can not only view or edit in Microsoft Excel, but import to LVP MLIS when creating new tasks and DBSO.

- contents of the folder **Shells** — files of language shells for the current program interface;

Note

The installation set of LVP MLIS EO 1.3 includes two files of shells for Russian and English languages: **Shell (EO 1.3).rus** and **Shell (EO 1.3).eng**.

- contents of the folder **Solving** — in this initially empty folder temporarily are placed data files for the tasks which are in the stage of solving;
- contents of the folder **System**:
 - **Config** — a configuration file, wherein is set a sign of the program localization in the case when in the process of operation the localization mode will not change;
 - **info** — a text file containing three main parameters of the used computer: processor type, clock rate and the volume of operative memory;
 - **Languages.txt** — a text file containing a list of possible language shells for the interface of this program;
 - **Programs.txt** — a text file containing names of those programs (including this one), for which may be created language shells by using the utility program ГЯО 1.0 (GLS 1.0);
 - **protocol.prt** — file of a protocol of tasks, being solved by the user, which holds general information about all existing tasks and their current state;
- contents of the folder **User documents**:
 - files of three Russian-language documents in the subfolder **rus**:
 - **Инструкция по эксплуатации ГЯО 1.0.pdf**;
 - **Инструкция по эксплуатации ОБП МЛИС ОП 1.3.pdf**;
 - **Технические характеристики МЛИС-МСИС ОП 1.3.pdf**;
 - files of three English-language documents in the subfolder **eng**:
 - **Instruction manual of GLS 1.0.pdf**;

- **Instruction manual of LVP MLIS EO 1.3.pdf** — file of this manual;
 - **Technical characteristics of MLIS-MNIS EO 1.3.pdf**.
3. If you want to set the *constant* mode of localization of the program LVP MLIS EO 1.3, which will not change during its operation, then do it in the service file **Config** using OS Windows by entering a numeric sign of localization in the second line of the file, namely: "1" — purchasing goods (GD), "2" — purchasing services (SR), "3" — purchasing goods and services (GS), "4" — purchasing meals and drinks (MD). Otherwise, you shouldn't do it (this line must be empty).
 4. Make changes in the **info** file using OS Windows, specifying there the actual settings of your computer: processor type, clock rate and the volume of operative memory.
 5. For ease of launching the program LVP MLIS EO 1.3, create a shortcut for its file **Lite_MLIS_EO.exe** and place it on the desktop of your computer.

Run the program in operation

1. Click on the boot file **Lite_MLIS_EO.exe** of the program or on its label. At that happens the following:
 - in the absence in the folder **Shells** of any language shells files appears on the screen a warning message that the work in the program LVP MLIS EO 1.3 for this reason is impossible and it emergency closes;
 - in the presence in this folder of only one language shell file is launched the program, which interface is presented by the language of this shell;
 - in the presence there of two or more files of language shells happens transition to the next instruction item.
2. On the screen opens the window of the program LVP MLIS EO 1.3 without any records of its interface, and in its center appears a small dialog under the name **Selection of program interface language**. From the drop-down list of this dialog select desired language of program interface and click the button **OK**. At that, the dialog closes and in the program window, which becomes available to work, appear necessary records in language that you just selected. In the same language will be output any text entries in all windows of the program, as well as all information provided in it.

Operations with tasks

Creating a new task with unique parameters

If parameters of a new task of expenses optimization will differ significantly from similar parameters of any existing task, do the following:

1. Choose the command **Input of tasks**⇒**Input of a new task**. If in the service file **Config** has not been set a sign of the program localization, on the screen opens the dialog **Input**

of the task data in which choose the required localization mode (four switches) and click the button **Forth**, passing to the dialog **Input of the task data (step 1)**. If the above mode has been set in the specified file, the last window will open immediately. Perform in it the following steps:

- enter a six-digit cipher of the new task, which may include Latin characters and digits (first field of the dialog);
 - enter a name of this task (second field);
 - choose a required database of sale objects (drop-down list).
2. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 2 of 8(9))**, wherein specify the following parameters:
- amount of money allocated for purchase of sale objects (SO) (first field);
 - parameters a and b for the cost of serving a buyer $y = a + b \cdot x$, where x — cost of acquired SO (second and third fields)
 - one of three options of creating alternative groups (AG) of SO
 - AG will not be created (left switch);
 - AG will be created on separate categories of SO (middle switch);
 - AG will be created on all categories at once (right switch).
3. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step of 8(9))**, wherein choose one of two criteria of utility of a SO sample:
- relative criterion, which is a utility ratio of a sample (left switch);
 - absolute criterion, which is a purchasing worth of a sample, that is calculated as the product of its utility ratio by its cost (right switch).
4. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 4 of 8(9))**, wherein form alternative groups of sale objects, in each of which will be automatically selected by the program only one of the presented there SO.
5. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 5 of 8(9))**, wherein set for each created alternative group of SO the following parameters:
- a possible sign of sameness of acquired samples of SO from this AG (checkbox);
 - minimum and maximum numbers of acquired samples of SO from this AG (two counters);
 - a value of the used criterion of utility for a sample of each SO from the current AG (slider).
6. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 6 of 8(9))**, wherein set for the required SO, not included in AG, the following parameters:
- a sign of choosing a SO (checkbox);

- a value of the used criterion of utility for its sample (slider);
 - minimum and maximum numbers of acquired samples of it (two counters).
7. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data (step 7 of 8(9))**, wherein you can see the list of selected for acquisition SO and their parameters.
 8. Click in the current dialog the button **Forth**. At that happens the following. If among selected by you SO are those for which are provided additional elements (AE), then opens the additional dialog **Input of the task data (step 7a of 8 (9))**, wherein select for such SO the required AE, then click the button **Forth**. If the current task has one of three possible trivial solutions, then on the screen will appear a panel with information about this solution, and when you click the button **OK** will occur the move to the item 9 of this instruction. In the case of absence of a trivial solution opens the dialog **Input of the task data (step 8 of 8 (9))**, in which specify the following parameters:
 - type of rounding the cost parameters (one of three switches);
 - duration of increment, which presents a step of rounding the cost parameters (first field of the dialog);
 - protective scaling factor, which provides protection of cost parameters from possible unauthorized access to them by third parties in case of performing the procedure of numerical optimization on another computer with the aim of accelerating the task processing (second field).
 9. Click in the current dialog the button **Forth**. At that happens the following. If this task uses the DBSO of unlimited type, then will occur a transition to the dialog **Input of the task data** (see below), and if it has limited type, then — to the dialog **Input of the task data (step 9 of 9)**, wherein you should set a unit or zero sign of the actual purchase of SO (left or right switch, respectively). In the first case the numbers of available samples of SO in DBSO will be automatically corrected after solving the task, and in the second case — no.
 10. Click in the current dialog the button **Forth**, passing to the dialog **Input of the task data**. Look through in it the main input data of the task and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the tasks input data. Otherwise, do one of two things:
 - at selected by default the switch **later** (it is at the bottom right) click the button **Ready**, causing the program to form two files in the folder **Data**: a common file of the task (**eo_<six-digit task cipher>.dat**) and its input file (**eo_<task cipher>_in.dat**).
 - select the switch **at once** (bottom left) and click the button **Ready**, causing this task to be solved at once without using stipulated for this aim the next commands: **Control**⇒**Work with a task protocol** и **Solving of tasks**⇒**Execution of optimization**.

Creating a new task with repetitive parameters

If the input parameters of the new task will be almost the same as in some existing task, do the following:

1. Choose the command **Input of tasks**⇒**Input of a new task by data import**. If in the service file **Config** has not been set a sign of the program localization, on the screen opens the dialog **Input of the task data** in which choose the required localization mode (four switches) and click the button **Forth**, passing to the dialog **Input of the task data (step 1)**. If the above mode has been set in the specified file, the last window will open immediately. Perform in it the following steps:
 - enter a six-digit cipher of the new task (first field);
 - enter a task name (second field);
 - choose a required database of sale objects (drop-down list).
 - select format of a being imported file which contains input data of another task: own format of the program (left switch **DAT**) or standard format Excel (right switch **XLS**);

Note

Mode of import into a new task of input data of another task, been stored in Excel-file, was introduced due to the fact that the program has a mode of export input data of existing tasks into files of Excel type (command **Export of task data to Excel-table** of menu **Output of tasks**).

- when selecting **DAT** do the following:
 - select in the first drop-down list the existing task, input data of which should be copied to the current task;
 - click the button **Import**, at that in the second drop-down list will appear the name of database sale objects, that is used in this existent task;
 - when selecting **XLS** do the following:
 - click the button **Import the Excel-file**;
 - in the opened dialog **Open** select on the disk required file (with extension "xls"), and click the button of the same name;
 - if necessary, select a different DBSO, than the one that was used in the imported existing task (second list).
2. Moving with the button **Forth** from the current dialog to a next one, look through in all nine or ten dialogs the input data of a current task and make necessary changes in them.
 3. Click the button **Ready** in the last dialog. At that, in the folder **Data** are created two files of the task: general and input.

Correction of task input data

This operation can be performed in two ways:

- during the operation to create a new task (see above);
- by using the command **Input of tasks**⇒**Correction of input data of unsolved task**, that is available for use to such unsolved tasks, which input files have not been copied to the folder **Solving** for their solution (selection of a task to correct its input is made in the dialog **List of tasks**, which opens on the screen when executing this command).

Uploading a file with input data of a new task

After creating a new task, you need to copy its input file (with input data of the task) to the folder **Solving** for its subsequent solution (see below). This operation is executed in the following order:

Note

After completing the operation in question concerning to some unsolved task you can not correct its input data.

1. Choose the command **Control**⇒**Work with a task protocol**, opening the dialog **Protocol of tasks**.
2. Select in the dialog upper list the required task, for which the operation in question was not fulfilled (this is indicated by the record "A stage of data input" in line "Task state" of the protocol table).
3. Click the button **Upload the file of task input data**, which in this case becomes unlocked. At that happens the following:
 - in the folder **Solving** appears a duplicate of the input file of current task;
 - in line "Task state" of the protocol table appears record "Waiting for solution";
 - the button **Upload the file of task input data** becomes locked.

Solving tasks

Operation of solving tasks, which input files are placed in the folder **Solving**, is performed in the following order:

1. Choose the command **Solving of tasks**⇒**Execution of optimization**, opening the dialog **Optimization module of MLIS EO 1.3**.
2. Set the required mode of processing: *batch* (for solving all group of tasks) or *individual* (for solving only one task), and then click the button **Next**.
3. When working in batch mode, do the following:
 - if necessary, adjust specified parameters of optimization, and then click the button **Next**;

- click the button **START** at the bottom, resulting in a process of successive solving the tasks of this group, when a name of this button changes to **WORK**;
 - after this button again be called **START**, which indicates the completion of solving the entire group of tasks, close the dialog **Optimization module of MLIS EO 1.3** by clicking the button **EXIT** (bottom right).
4. When working in individual mode, do the following:
- type in the dialog field a six-digit cipher code of a solvable task and click the button **Next**;
 - if necessary, adjust the parameters of optimization scheme, and then click the button **Next**;
 - click the button **START** at the bottom, resulting in a process of solving selected task, when a name of this button changes to **WORK**;
 - after this button again be called **START**, which indicates the completion of solving the current task, close the dialog **Optimization module of MLIS EO 1.3** (button **EXIT**).

Connecting a file with task solving results

After performing the operation of solving the tasks you should transfer files with the result of their solution (**eo_<task cipher>_out.dat**) from the folder **Solving** to the folder **Data**. This operation performs in the following order:

Note

After performing this operation concerning some solved task it is impossible its repeated processing. That may be required, in particular, in case of absence of its successful solution due to wrong choice of values of the optimization schemes parameters.

1. Choose the command **Control⇒Work with a task protocol**, opening the dialog **Protocol of tasks**.
2. Select in the upper dialog list the required task, which input file was copied to the folder **Solving** (this is indicated by the record "Waiting for solution" in line "Task state" of the protocol table).
3. Click the button **Load the file of task solving results**, which in this case becomes unlocked. At that happens the following:
 - input file of the current task is removed from the folder **Solving**, and its output file is moved from this folder to the folder **Data**;
 - in line "Task state" of the protocol table appears record "Task is solved";
 - the button **Load the file of task solving results** becomes locked.

Working with a tasks protocol

A protocol of tasks contains general information about existing tasks of network purchases optimization, being solved by LVP MLIS EO 1.3 (these data are stored in the file **protocol.prt** placed in the folder **System**). On the screen displays in tabular form such part of the protocol, which refers to a user-selected task. It contains the following formation:

- cipher and name of this task;
- current state of the task, which can be one of three: " A stage of data input", "Waiting for solution" or "Task is solved";
- dates and times of occurrence for the four different event.

Transition to the mode of work with a tasks protocol is performed by the command **Control⇒Work with a task protocol**, which opens the dialog **Protocol of tasks**. In this window, the following operations can be performed:

- viewing general information about the existing tasks;
- upload the input file a new task, that contains its input data (see above);
- connecting the output file of the task containing the results of its solution (see above);
- removal of those tasks that are no longer necessary for the user (button **Delete the task**).

Canceling the mode of purchasing sale objects for the solved task

This operation is needed in order to implement the possible refusal of the user from purchasing such set of SO samples, which was selected by the program from the used DBSO of limited type. Such refusal will happen by zeroing a unit sign of real purchasing SO for the required solved task, using a DBSO of limited type. At that will be performed the automatic correction of the numbers of SO samples in this database by adding those previously selected samples, from which the user has refused.

The operation is performed by using the command **Control⇒Cancel of the mode of purchasing GD/SR/GS/MD for solved task**.

Output of task input data

Input data for any existing task of network purchases optimization may be brought out to the screen, Excel-file and print. This operation is performed in the following order:

1. Choose the command **Output of tasks⇒Viewing input data of any task**.
2. In the opened dialog **List of all tasks** select the desired task and click the button **OK**. At that, the current dialog is closed and opens the window **Viewing input data of the task "<task name>"** with tabular input data of the task chosen by you, which can be looked through.

3. To bring out these data to a new Excel document, choose the command **Export of task data to Excel-table** of menu **Output of tasks**, to print them — the command **Print the task data** of the same menu.

Output of task solving results

Output data for any solved task of network purchases optimization may be brought out to the screen, Excel-file and print. This operation is performed in the following order:

1. Choose the command **Output of tasks**⇒**Viewing output data of the solved task**.
2. In the opened dialog **List of solved tasks** select the required task and click the button **OK**. At that, the current dialog is closed and opens the window **Viewing solution result of the task "<task name>"** with tabular output data of the task, which can be viewed.
3. To bring out these data to a new Excel document, choose the command **Export of the task data to Excel-table** of menu **Output of tasks**, to print them — the command **Printing the task data** of the same menu.

Operations with databases of sale objects

Creation of a new DBSO with unique parameters

If the contents of a new database of sale objects will be significantly different from that of any existing content DBSO, then follow these steps:

1. Choose the command **Work with databases of sale objects**⇒**Creation of a new DBSO**, opening the dialog **Creation of a database of sale objects (step 1 of 4)**, wherein do the following:
 - enter a three-digit code of the new DBSO (first field of the dialog);
 - enter a name of this DBSO (second field).
2. Click in the current dialog the button **Forth**, passing to the dialog **Creation of a database of sale objects (step 2 of 4)**, wherein specify the following parameters:
 - a possible sign of setting codes of the sale objects (two top switches);
 - type of the being created DBSO: limited or unlimited (two bottom switches);
 - units for cost of SO samples (drop-down list).
3. Click in the current dialog the button **Forth**, passing to the dialog **Creation of a database of sale objects (step of 4)**, wherein specify the following parameters of the categories of sale objects:
 - name of a SO category (second field of the table);
 - number of SO in the category (third field of the table).
4. Click in the current dialog the button **Forth**, passing to the dialog **Creation of a database of sale objects (step 4 of 4)**, wherein for each of the available categories of sale

objects (drop-down), specify the following parameters of SO:

- name of a SO sample (second field of the table);
 - description of the sample (third field of the table);
 - its cost (fourth field of the table);
 - for DBSO of limited type — number of SO samples, and for DBSO of unlimited type — a possible sign of its temporary absence (fifth field of the table);
 - number of additional elements (AE) in SO (sixth field of the table);
 - a possible sign of its temporary alternativity (seventh field of the table).
5. If at least some of SO contain AE (i.e. have positive values in the sixth field of the previous table), then when clicking the button **Forth** opens the additional dialog **Creation of a database of sale objects (step 4a of 4)**, wherein specify the following parameters of AE in SO:
- AE name (fifth field of the table);
 - AE description (sixth field of the table);
 - cost of one AE (seventh field of the table);
 - a possible sign of AE temporary absence (eighth field of the table).
6. Click in the current dialog the button **Forth**, passing to the dialog **Creation of a database of sale objects**. Look through in it the main data of the DBSO and if you are not satisfied by them, then using the button **Back** go to the desired previous dialog and make there necessary correction of the DBSO data. Otherwise, click the button **Ready**, causing the program to form in the folder **Dbscs** the file of DBSO of unlimited (limited) type under the following name: **<three-digit code of database>inf(fin)_dbscs_<three-digit code of language of the current program shell>.dat**;

Creation of a new DBSO with repetitive parameters

If the new database of sale objects will be based on one of existing DBSO, follow these steps:

1. Choose the command **Work with databases of sale objects**⇒**Creation of a new DBSO by data import**, opening the dialog **Creation of a database of sale objects (step 1 of 4)**, wherein do the following:
 - enter a three-digit code of the new DBSO DBSO (first field of the dialog);
 - enter a name of this DBSO (second field).
 - select format of a being imported DBSO file: own format of the program (left switch **DAT**) or standard format Excel (right switch **XLS**);

Note

Mode of import into a new DBSO of contents of another DBSO, been stored in Excel-file, was introduced due to the fact that the program has a mode of export contents of existing

DBSO into files of Excel type (command **Export of DBSO to Excel-table** of menu **Work with databases of sale objects**).

- when selecting **DAT** do the following:
 - select in the first drop-down list the existing DBSO, contents of which should be copied to the current database;
 - click the button **Import**;
 - when selecting **XLS** do the following:
 - click the button **Import the Excel-file**;
 - in the opened dialog **Open** select on the disk the required DBSO file (with extension 'xls'), and click the button of the same name.
2. Moving with the button **Forth** from the current dialog to a next one, look through in all five dialogs the data of a current DBSO and make necessary changes in them.
 3. Click the button **Ready** in the last dialog, whereby in the folder **Dbs** will be created a file of the new DBSO of specified type and language.

Corrections of DBSO contents

This operation can be run in two ways:

- in the process of performing the operation to create a new DBSO (see above);
- with the command **Work with databases of sale objects**⇒**Correction of DBSO** (choice of DBSO for its correction is made in the dialog **List of databases of sale objects**, which opens on the screen when executing this command).

Output of DBSO contents

Contents of any existent DBSO can be brought out on the screen and in the Excel-file. In the first case is used the command **Viewing of DBSO** of the menu **Work with databases of sale objects**, and in the the second — the command **Export of DBSO to Excel-table** of the same menu.