Mega Tester V4

Software instruction manual version 3.2

Content

1. About software

The software for the personal computer is developed in addition to the device to improve the usability of the device and to create the ability to perform actions that are impossible or difficult to perform through the device interface, such as reviewing test results of several injectors, saving test results, obtaining graphs of the voltage dependence of the piezo-actuator and etc.
The program interface is available in several languages. Currently in Russian, Ukrainian and English.

2. Getting and setting

The software is distributed for free with the device. The software is a Megatester.exe file.
Place it in your convenient directory.
Software requires Microsoft .NET Framework 4.7.2 or compatible. It is usually already installed in Windows 10. If this is not the case, then you need to update the Windows operating system, or download the .NET Framework from the Microsoft website and install it by yourself.

3. Run the program and connect to the device

Run the program from the Megatester.exe file.

When you first start the program offers to choose the interface language. Select a language and close the window. In the future, this window can be opened by clicking on the “Customize” button.

The device is connected to the personal computer through the USB interface. The program connects to the device automatically when it is connected to the computer.

The connection status is displayed in the lower part of the program window. If you see a red box with the caption “Not

connected" - connect the device to the computer and turn on the device power. The red box should change to green with the "Connected" signature.

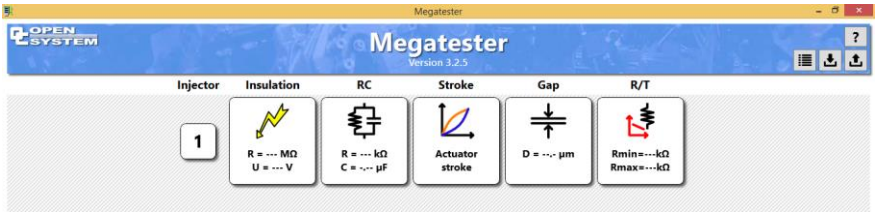
4. Main window

The main program window displays the measurement results from one to eight injectors. At the bottom of the window there are buttons that allow you to add and remove injectors.

Press the [+] button several times to add the required number of injectors. The [-] button removes the last injector. It is intended for remove erroneously added injector. The [x] button removes all injectors. Use this button after completing the injectors set test to go to the next set.

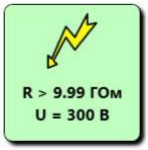
In the first column contains the number or designation of the injector. Clicking on the injector number will open a window that allows you to change the injector designation, move it up or down in the list, delete the injector as well.

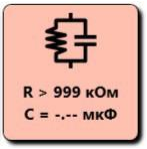
5. Run tests and save results



Subsequent columns represent tests that can be performed with the appropriate injector. In them test results are displayed. Clicking on the corresponding square opens the test window. Each test window contains a button for fixing results.

If you consider the result of the test as satisfactory, press the "Result success" button. The result will be recorded in the main window and the color of the corresponding box will change to green.





If you consider the result to be unsatisfactory, press the "Result failure" button. The result will also be recorded in the main window, but the color of the corresponding box will change to red.

If you do not want to record the result, simply close the test window. The result will not be recorded, and the data displayed in the main window will remain unchanged.

If you want to erase the previously obtained result from the main window, click on the appropriate box and in the test window that opens, click the "Erase result" button. The test window closes, and the test box turns white again and does not contain any result.

After testing the set of injectors, the results can be saved in a file.  To do this, click the "Record results" button in the upper part of the main window, select the directory to record and enter the file name. Saving the results to a file, you can now delete all injectors in the main window using botton [x] and proceed to test another set of injectors.

In the future, you can view previously saved results by reading them from a file back into the program. To read previously saved results, click the "Read results" button at the top of the main window, select the appropriate directory and file — the previously saved results will be displayed again in the main window. 

6. Shortcut Keys

In addition to using the mouse, the program's functions can also be activated by pressing keys on the keyboard. Press the signed key [+] on the main keyboard in order to add a new injector to the list. [-] - to remove the last injector. The full list of keys for the main window is below.

[+] Add injector
[-] Remove the last injector
[X] Delete all injectors
[`] Open the settings window
[W] Write results to file
[R] Read the results from the file
[1..8] Open the information window on the 1st .. 8th injector in the list
[I] [1..8] Open the isolation test window
[C] [1..8] Open the window for measuring the resistance and capacity
[S] [1..8] Open the window measuring the stroke of the actuator
[G] [1..8] Open the window for checking the gap

Keys available for control in the injector information window:
[↑] Move the injector up
[↓] Move the injector down
[X] Delete selected injector

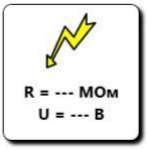
7. The settings window

By clicking on the “Configure” button in the main program window, you can open the settings window. The settings window allows you to select the interface language, displayed tests and enter service codes.

If you do not use any tests in your work or your device does not support any tests, you can turn off their display. To do this, in the "Display" group uncheck the boxes next to the corresponding tests and click on accept button.

The buttons "Create service request" and "Execute service code" are used to receive and execute service codes. They are described in Section 15 "Obtaining Service Codes".

8. Insulation check



To open the isolation test window, click on the square corresponding to the picture. In the window that appears, select the desired voltage by moving the "Test voltage" slider. Connect the injector to the device with a cable to check the insulation. Click the "Start" button. A high voltage will be applied to the injector.

You can observe the voltage value on the "Under Voltage" indicator. Upon completion of the test, the insulation resistance under the specified voltage will be determined and displayed in the column "Insulation resistance".

By clicking on the "Result satisfactory" or "Result unsatisfactory" button you can save the result in the main window.

Shortcuts to the isolation test window:

[space] Start / stop verification

[+] Increase test voltage

[-] Reduce test voltage

[End] Set the highest test voltage

[Home] Set the lowest test voltage

[`] Configure the test parameters

9. The notes

The test windows contain a notes panel where you can make your notes related to the corresponding test. For example, your instructions for the test, the features you found, parameters, help information, and etc.

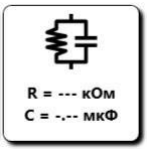
The notes are saved for the program and test as a whole and not for each individual injector.

The program can be supplied by the manufacturer with existing notes. In the process of using the program, you can change the notes preset by the manufacturer.

To open or close the notes panel, click on the “Notes” button in the test window.

10. Measurement of resistance and capacity

To open the window for measuring the resistance and capacity of the injector, in the main window, click on the square corresponding to the picture. Connect the injector to the device with a cable for measuring resistance and capacitance and press the “Start” button. Upon completion of the measurement, the resistance and capacity of the injector piezo actuator are displayed respectively in the columns “Resistance” and “Capacity”.

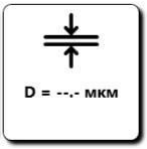


By clicking on the “Result satisfactory” or “Result unsatisfactory” button you can save the result in the main window.
Shortcuts:
[space] Start / Stop measurement

11. Checking the GAP

This function measures the gap between the piezo actuator and the injector hydraulic valve pusher. The gap is designed to compensate for thermal expansion of the piezo actuator, in order to avoid pressing the piezo actuator in an inactive state on the valve due to the heating of the injector.

The size of the gap depends on both the temperature and the degree of polarization of the piezoelectric. Therefore, it is recommended to measure the gap size after cooling the injector at room temperature for about 3 hours and there is no impact on the piezo actuator of too high or negative voltage.



To open the gap setting window, click on the square in the main window of the program corresponding to the picture. Connect the injector to the device with the appropriate cable (the same as for measuring capacitance and resistance) and press the “Start” button.

An arrow appears on the indicator scale, indicating the size of the gap. If there is no arrow on the indicator, this means that there is either no gap (the device cannot measure a gap smaller than 1 micron), or the gap is too large to measure.

After completing the measurement or adjustment of the gap in the injector, press the “Stop” button. The last value of the gap can be fixed in the main window by pressing the “Result satisfactory” or “Result unsatisfactory” button.

Shortcuts:

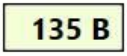
[space] Start / Stop measurement

12. Measuring the stroke of the piezo actuator

The program allows you to apply different voltages to the piezo actuator and measure its elongation using a micrometer. Results are displayed in the form of tables and graphs.

To enter this mode, click on the square in the main window as in the picture.

To supply voltage to the piezo actuator in manual mode, press the "Manual mode" button. Move the slider that appears to set the voltage. The actual value of the voltage on the actuator is displayed on the indicator below.



Lengthening the piezoelectric element can be measured manually and enter the data into the table.

To do this, click the "Measure" button. The current voltage value will be moved to the table. Enter the appropriate extension value in the right column.

It is also possible to connect a micrometer to a computer and automatically read its readings. Connect the mic to the computer, open the settings window, select the mic type and the connection port. *Currently, only TESA Digico micrometers are supported.*

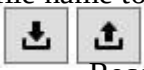
Now, when you click the "Measure" button, both the current voltage value and the micrometer reading will be automatically entered in the table.

It is also possible to automatically obtain a graph of the dependence of the lengthening of the piezo actuator on the applied voltage on the forward and reverse course. To do this, connect a micrometer and click the "Start" button. The program will begin to automatically apply voltages with a given step on the actuator and

enter the corresponding micrometer readings in the table. Voltage range, step and waiting time before reading can be changed in the settings window.

The resulting graph can be saved as a result of testing the injector by pressing the button “The result is satisfactory” or “The result is not satisfactory”.

In addition, the received data can be separately saved to a text file. To do this, click on the “Record” button, select the directory and file name to write.



Recorded data can be loaded back into the program window by pressing the button “Read”. Also previously recorded data can be downloaded for comparison with the current schedule.
To do this, click the “Compare” button and select the data file.

Downloaded data will be displayed on the background of the current graph in gray. To remove the display of comparative data, click the “Compare” button again.
Shortcuts:
[space] Start / pause automatic measurement
[S] Stop automatic measurement
[V] Enable / disable manual measurement mode
[M] Measure / read the micrometer value in manual mode
[`] Open the settings window
[W] Write data to file
[R] Read data from file
[X] Read data table
[=] Download data for comparison
[]] Increase the voltage on the piezo actuator (when manual mode is on)

[[] Reduce the voltage on the piezo actuator (when manual mode is on)
['] Apply the highest voltage (when manual mode is on)
[;] Apply the lowest voltage (when manual mode is enabled)

13. Continuous resistance measurement

Some poorly maintained piezoelectric elements tend to drop resistance for a short time after switching on. That is, with a single measurement of the resistance, it is within normal limits, but after several minutes of operation, the resistance of the piezoelectric element drops to an unacceptable value.

To determine such injectors, click in the main window of the program on the box corresponding to the figure. Connect the injector to the device and in the window that opens, click on the “Start” button. After the injector discharge procedure, the device will begin a continuous measurement of the resistance of the piezoelectric element, while fixing the largest and smallest values of all measurements.

The smallest and largest recorded resistances are displayed in the program in the “Minimum” and “Maximum” columns, respectively. At the bottom of the window, a graph of resistance changes over time is displayed.

Choosing the type of injector, you can see whether the resistance of the piezoelectric element exceeded the permissible limits during the measurement process both in the columns “Minimum” and “Maximum”, and on the graph.

Upon completion of the test, click on the “Stop” button. Using the button “Result is satisfactory” or “Result is unsatisfactory” you can save the obtained values of the highest and lowest resistance in the main window.

14. Independent Internationalization

You have the opportunity to independently translate the program interface into your language. To do this, run the program from the command line with the parameter: Megatester.exe Lang.Export = EN

As a result, the Megatester.lng file containing text strings in English will appear in the program directory.

If the program at start finds the Megatester.lng file in the same directory as the launched Megatester.exe file, it loads the corresponding lines from this file.

Translate in this file the lines to the right of the keys of the form “*0000”, restart the program and these lines will change in the program interface according to your translation. Do not touch the keys themselves and do not remove special characters from the translated strings.

You can also translate not from English, but from another language available in the program by exporting it to the Megatester.lng file by replacing EN in the command line with UA or RU.

After the translation is completed, send the Megatester.lng file to us and we will add your language to the program.

15. Obtaining service codes

Service codes allow the manufacturer to remotely change device parameters, the change of which is not available to the user. This can be done, for example, in order to eliminate errors in the operation of the device or provide access to additional features.

The need to enter a service code is established by the manufacturer in response to a user request for service maintenance of the device. If the manufacturer informed you that in order to achieve

the result you must enter the service code you need to do the following:

- Open the settings window and click on the button “Create service request”. In the save file window that opens, select the desired location on the disk and save the file, for example, in some directory for temporary files. The program saves information on the version of your device, its serial number and service counter in a file. Send the received file to the manufacturer. Get the service code file from the manufacturer. Open the settings window and click on the “Execute service code” button. Select the received file and click on the “Open” button. The service code from the file will be transferred to the device and you will see a message about the success or failure of its execution.

The service code can be executed only once and only on the device on which the service request for this code was created. After successful execution of the service code, its repeated execution is impossible. Service code execution on other devices is not possible.