New software STARDEX SISU user manual

STARDEX 0303, 0304, 0305, 0306, 0402, 0403

STARDEX Master Ultima

STARDEX Dimas

STARDEX Dimas Ultima

Foreword

For more than 15 years, we have been developing and manufacturing specialized equipment for testing modern diesel injection systems for both cars and trucks, marine engines and industrial engines.

The accumulated experience allowed us to rethink the work that has been done and in 2013 we started developing new products that fully meet the latest requests of our users. The main goal of this work was the creation of inexpensive, reliable, highly professional diagnostic complexes that would allow reaching a qualitatively new level of inspection and repair of modern diesel systems.

In 2016, along with a new line of ULTIMA equipment for testing Common Rail systems, pump injectors and HEUI, we have released software that is universal for all STARDEX devices, both the last and the previous generation.

STARDEX company is glad to present to your attention new software for testing the Common Rail system nodes, which allows to fully reveal the potential of our equipment.

This instruction manual for the software covers almost all simulators and test benches of our production (STARDEX 0303, 0304, 0305, 0306, 0402, 0403, STARDEX Master Ultima, STARDEX Dimas, STARDEX Dimas Ultima).

On different STARDEX devices, the functionality of the software can be significantly different!!!

Table of contents

What's new

Universal software for all STARDEX Common Rail simulators

Better support for wide screen and HD monitors

Simple control, automatic and semi-automatic testing modes with minimal operator involvement

Extensive additional functionality for experienced users with the ability to change almost any test parameter according to your needs

A lot of additional information on the tested products. Geometric gaps, strokes, adjustments, as well as cross references, usability, detailing and more

Support of pressure sensors 1500, 1800, 2000, 2200, 2400 bar

Measurement of the resistance, capacitance and inductance of injectors

Measurement of injection delay using the STARDEX piezo sensor

Detailed tooltips for each component in different languages

Simple creation of testplans using template or from scratch

Ability to create and save your own volt-ampere profiles

Improved support for color printers and ability to save reports in PDF

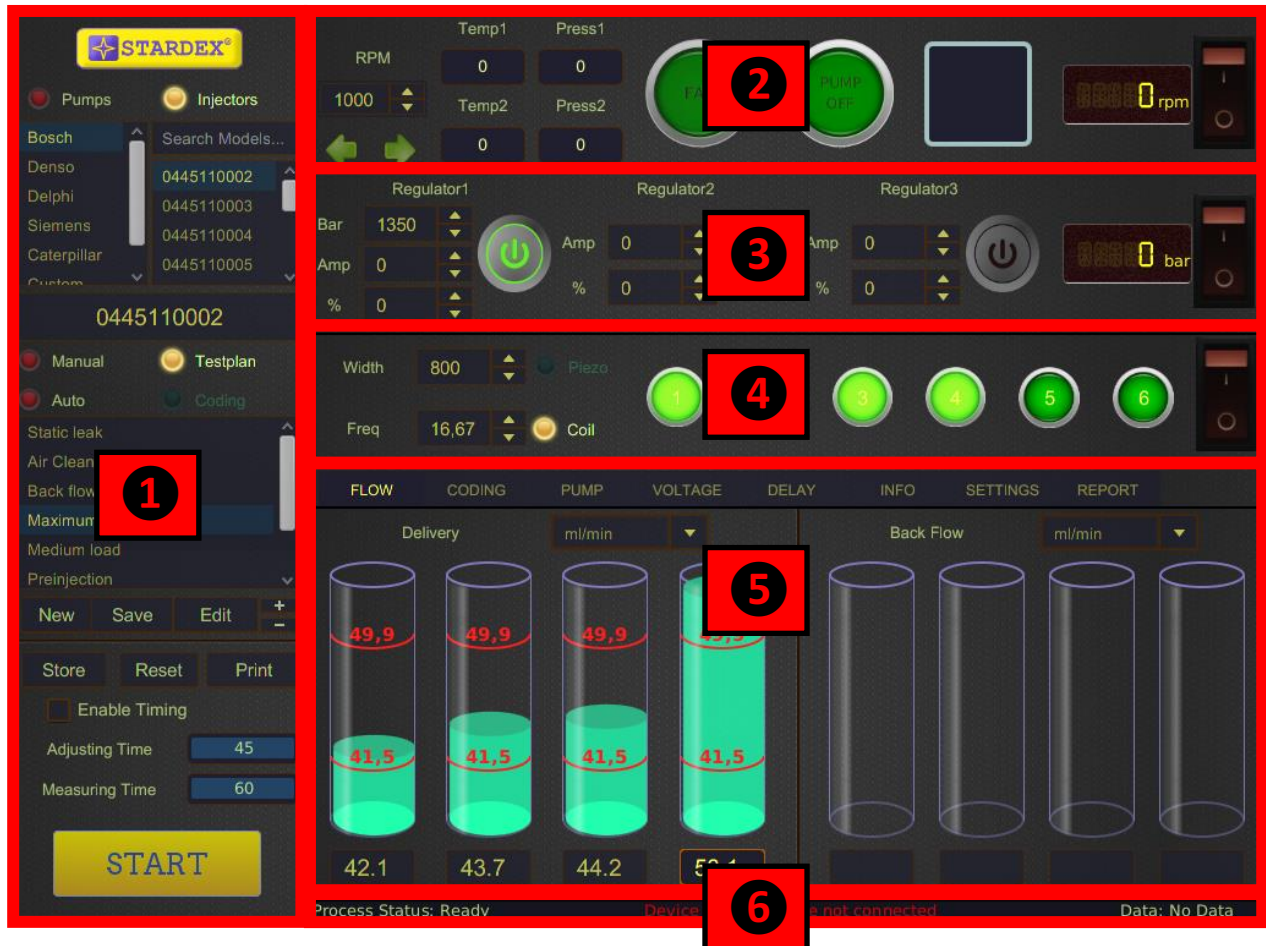Ability to insert the logo and company details in the test report

A huge base of injectors and pumps of major world manufacturers

Frequent update of the database and constantly increasing functionality of the program

Delphi C2I, Delphi C3I, Bosch IMA and Denso coding

Lifetime free software updates for all STARDEX users

Main screen

1. Main section.

2. Test bench control section.

3. High pressure control section.

4. Injector control section.

5. Additional section.

6. Status bar.

Main section

Pump test mode	Injector test mode
Manufacturers list	Search field
	Manufacturer/OEM number
Manual test mode	Selected product
Auto test mode	Semi-auto test mode
	Coding test mode
Tests list	Edit testplan
Save testplan	
New Test-plan/VA profile	Add/Remove test plan
Store flow meter results	Print report
	Activate timers
Reset flow meter results	Adjusting timer
	Measuring timer
Main Start/Stop	

STARDEX®

Pumps   Injectors

Bosch
Denso
Delphi
Siemens
Caterpillar
Custom

Search Models...

0445110002
0445110003
0445110004
0445110005

0445110002

Manual   Testplan

Auto   Coding

Static leak
Air Cleaning
Back flow
Maximum load
Medium load
Preinjection

New   Save   Edit   + −

Store   Reset   Print

Enable Timing

Adjusting Time   45

Measuring Time   60

START

Work with the device starts with the main section.

Firstly, choose the type of device to test – pump or injectors. Then choose the manufacturer and the serial number of the product. Enter part of the serial number into the search field and only the appropriate results will be displayed in the list below.

The next step is to choose the test mode.

In MANUAL mode, all the test parameters are set by the user. In this mode there is no testplan and there is no report on the results of testing. Current-voltage characteristics of the signal to the injectors will correspond to the current-voltage characteristics of the product with the selected number. This mode is recommended only for advanced users.

In the TESTPLAN mode, a test is performed following the test plan parameters. In each test, all the set and measured parameters are preset. Navigation through the tests is done by left-clicking on the test list. Most of the parameters can be changed, according to the user's needs.

In the AUTO test mode there is no ability to change test parameters and navigate through the tests. All the tests go in preset order.

The CODING mode is designed for getting repair codes for injectors. As in AUTO mode all the tests go in preset order, but the number of tests is significantly bigger, which leads to longer testing time. At the end of the process, repair codes for injectors appear in the additional section in the CODING section. NEW, EDIT, SAVE, "+", "-" buttons are used when creating and editing your own testplans/profiles.

STORE button saves the current flow or backflow in the report. RESET button resets the current flow or backflow value and allows you to restart the flow measurement. When ENABLE TIMING is activated by ticking the corresponding field, the flow measurement is done in accordance with preset timers. During ADJUSTING TIME, the user is given an opportunity to estimate the flow, but the final accurate measurement is displayed and automatically saved in the report only after the end of the MEASURING TIME. Using timer increases the accuracy of measurement and the repeatability of test results.

PRINT button opens an additional window in which you can print test results on the printer, save report in PDF, change the company logo and info on the printed form, enter customer data.

START / STOP button is used to start / stop testing in AUTO and CODING modes. In MANUAL and TESTPLAN modes it turns on/off test bench control section, high pressure control section, injector control section. The sequence of activation is: firstly the test bench control section, then pressure regulators and lastly injector control sections. When STOP is pressed all sections are turned off simultaneously. The user can start all the sections manually if needed (only TESTPLAN and MANUAL modes).

Test bench control section
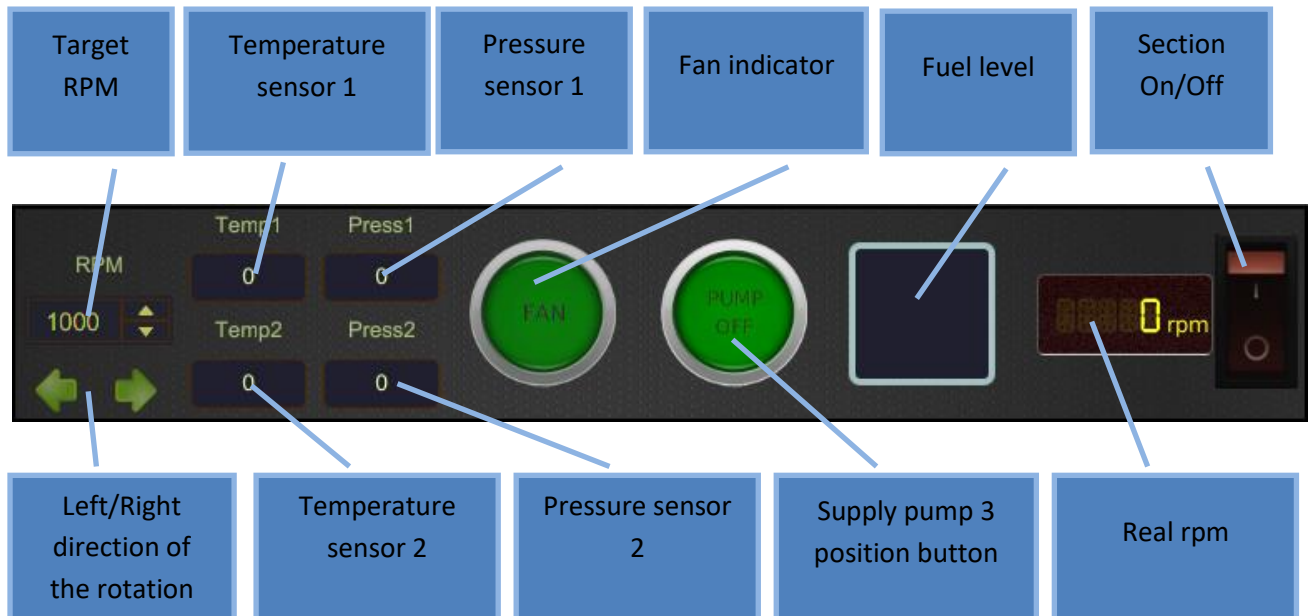
This section is available for users of kits based on STARDEX 0801, 0802, 0803, STARDEX DIMAS, STARDEX DIMAS ULTIMA work benches.

In the section there are controls of the motor and booster pump of the work bench, as well as instruments for monitoring temperature and pressure in the main lines of the work bench, fuel level in the tank, cooling fans.

Before starting work on the bench it is necessary to set the rotation direction of the motor (right / left) in accordance with the high pressure pump installed on the bench as well as turn on the supply pump or put it into automatic mode.

At STARDEX work benches equipped with their own high-pressure pumps, the rotation direction of the pump is right by default.

To activate booster pump click boost pump indicator. Clicking it again sets automatic mode of booster pump. One more click turns boost pump off. In automatic mode boost pump starts simultaneously with the start of the motor's rotation.

To start test bench motor rotation click the motor section switch button or the main START/STOP button. The engine will gradually gain the target speed. To stop, turn off the section switch or use the main START/STOP button.

Pressure regulators section
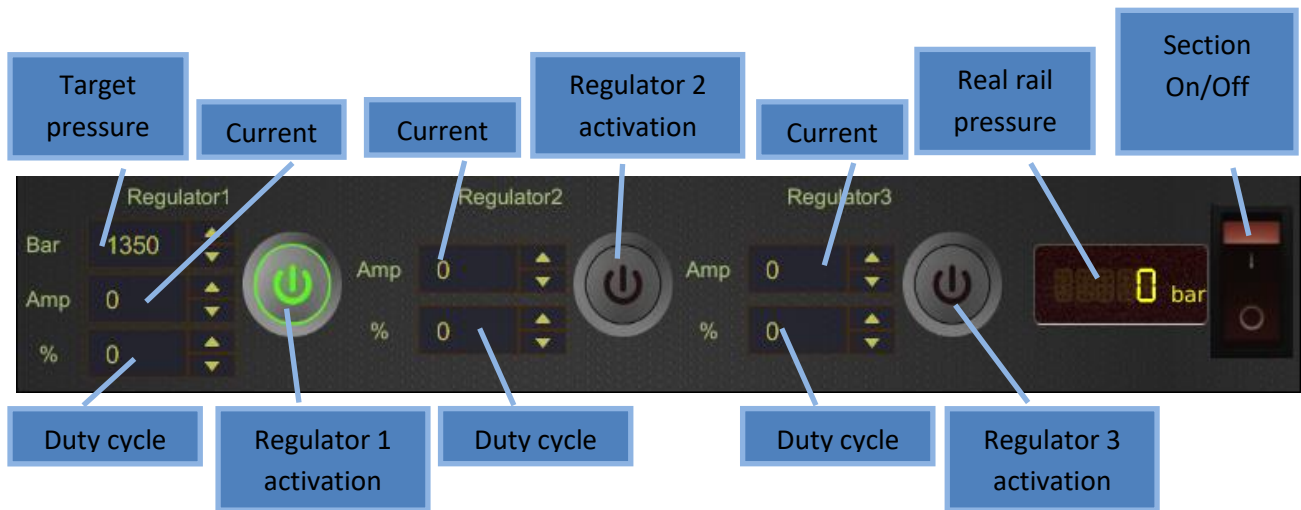
In the section there are controls of the pressure regulators. The real pressure in the rail is also displayed here.

If the regulator is activated, then when the section is switched on, the signal necessary to reach the target value is sent to it. Current, duty cycle, pressure can be a target value.

Double pressing of the pressure regulator activation button sets constant power on mode. In this mode, the signal to the pressure regulator is given regardless of the position of the section switch. This function can be useful when working with a pump with installed normally closed SCV.

The values of current, duty cycle and pressure can be changed during testing process.

Injector control section
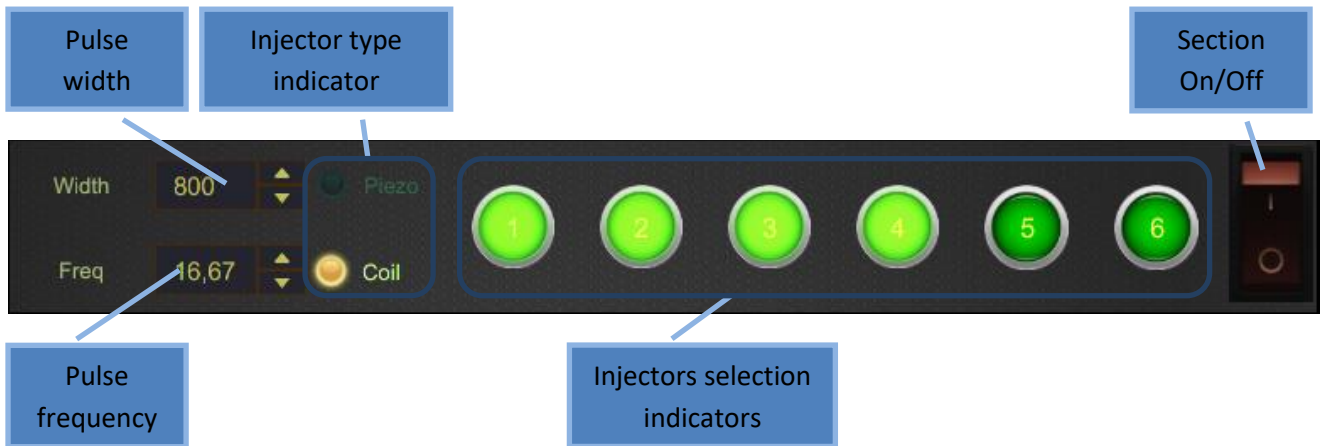
In this section there are controls of injectors.

The work with this section is different for single-channel and multi-channel devices. For a single-channel device, the injector selection buttons determine which injector from the kit you are checking (only one button can be pressed). For multi-channel devices, each injector selection button is linked to a numbered cable which is connected with the injector and if multiple injectors are selected they work simultaneously.

The signal to injector is characterized by the length, frequency and current-voltage profile. It is important not to be mistaken with the type of injector tested. If the current-voltage profile does not correspond with the injector under test, in some cases the injector or device may break down!!!

It is very easy to check the injector type: measure resistance between the contacts of the injector using tester. In the solenoid valve the resistance is not more than a few ohms. In a piezo injector the resistance is approximately several hundred kOhms.

STARDEX devices generation ULTIMA are equipped with a measuring module to measure resistance, capacity and inductance of installed injectors. Also in ULTIMA generation there are more opportunities to generate a signal of the required shape and another parameterization of the signal current-voltage profile. For more details, refer to the sections "Current graph and current-voltage characteristics "and "Measuring module".

To send a signal to injectors, first activate the necessary injectors by clicking on the corresponding numbered indicators and then click section on button. The signal with a preset length and frequency is sent to the activated injectors.

Also, when the START / STOP button is pressed in the main section, this section is started automatically immediately after setting the target pressure.

Additional section. Injector flow meter
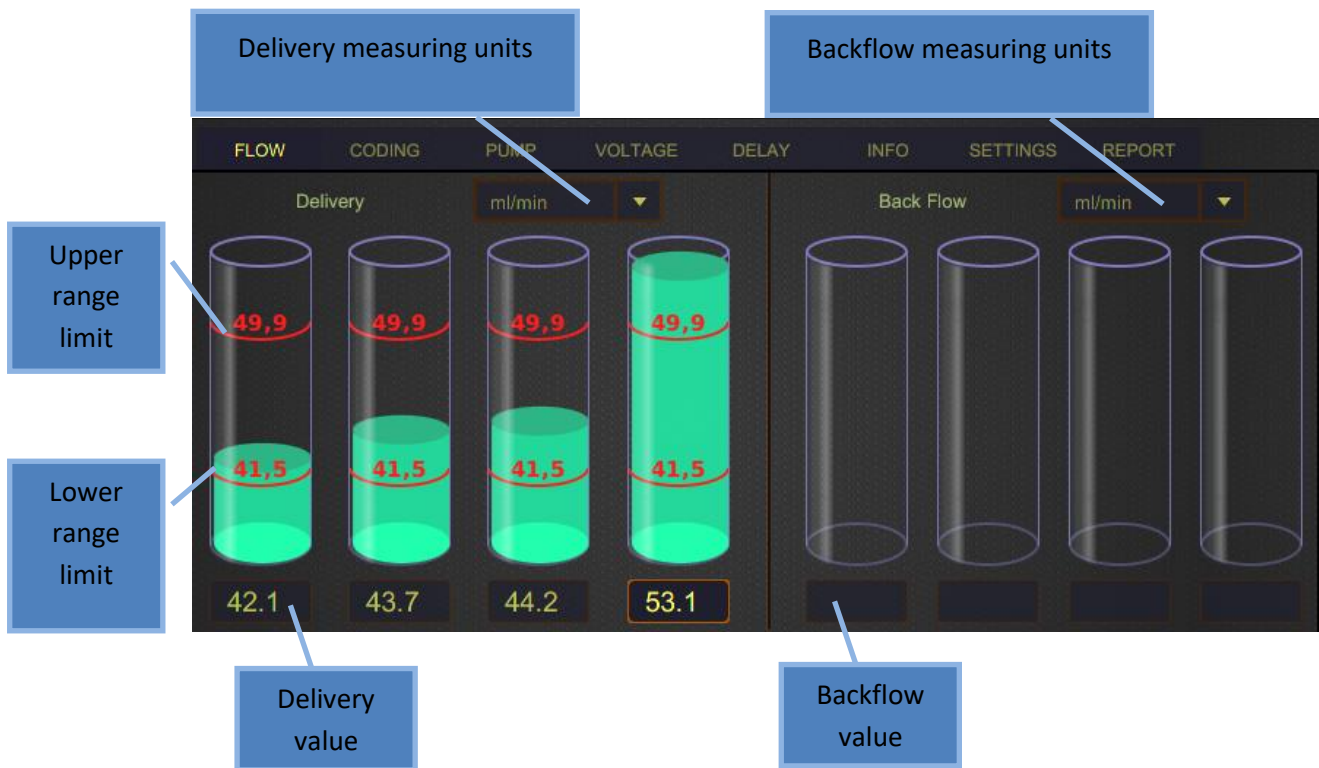
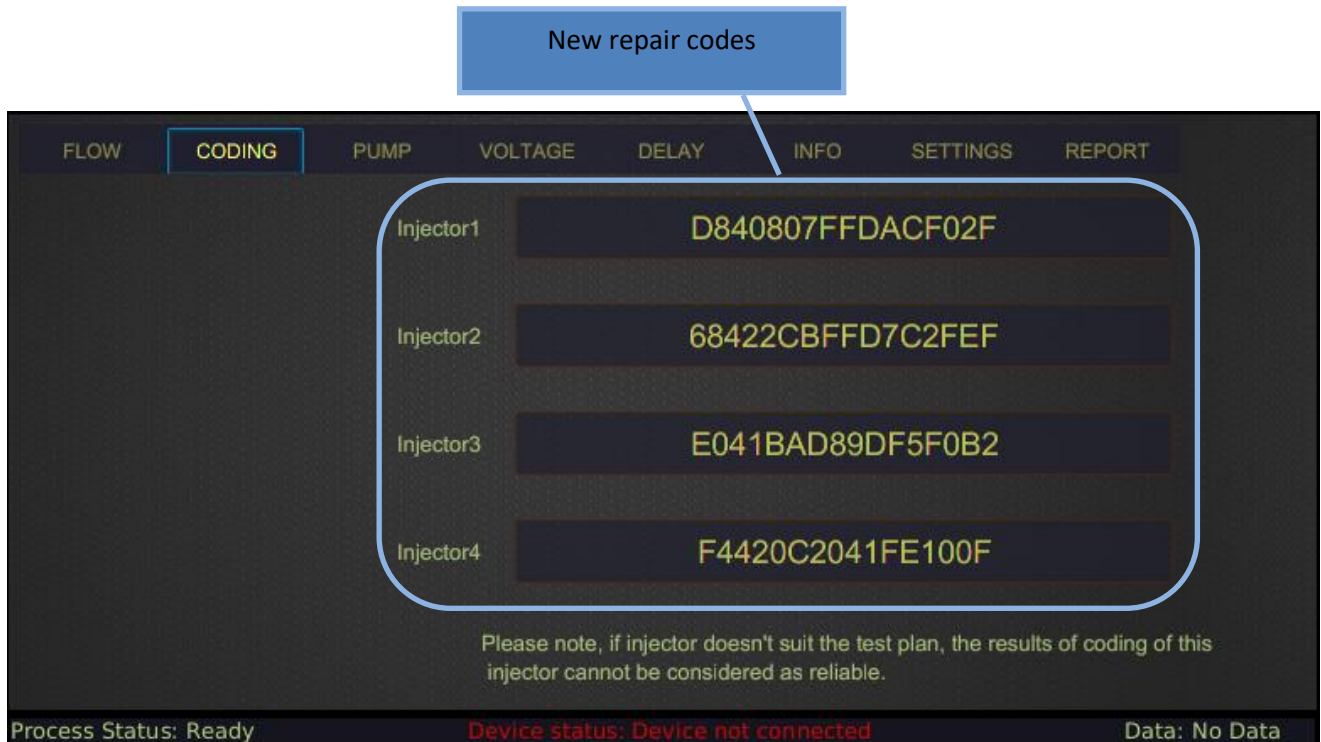This section used to measure flow and backflow of injectors.

When using STARDEX devices equipped with an electronic measuring unit, measurements are made automatically. The flow measurement data is saved in the report when the MEASURING TIME timer reaches the end or when clicking STORE button in the main section. If you click RESET button in the main section, the measurement is reset and the measurement process starts again.

If there is no electronic measuring unit, then the measurement should be carried out in the test bench beakers, and the results should be entered manually in the flow value field.

For convenience the units of measurement can be changed from ml/min to ml/100cycles, ml/200cycles, ml/1000cycles, l/hour.

If TESTPLAN or AUTO modes are selected, the upper and lower range limits for the test are displayed on the beakers. In MANUAL mode, there is no target flow data.

Additional section. Coding

New repair codes

| FLOW | CODING | PUMP | VOLTAGE | DELAY | INFO | SETTINGS | REPORT |

Injector1   D840807FFDACF02F

Injector2   68422CBFFD7C2FEF

Injector3   E041BAD89DF5F0B2

Injector4   F4420C2041FE100F

Please note, if injector doesn't suit the test plan, the results of coding of this injector cannot be considered as reliable.

Process Status: Ready   Device status: Device not connected   Data: No Data

To start the assignment of codes to injectors, you need to choose CODING mode in the main section, select manufacturer, injector number and start the test with the START / STOP button in the main section. Upon completion of the coding process, new repair codes are displayed in this section.

The function of coding injectors is only available with STARDEX electronic flow measurement system.

Additional section. Pump flow meter

Delivery measuring units

Back flow measuring units

FLOW   CODING   PUMP   VOLTAGE   DELAY   INFO   SETTINGS   REPORT

Delivery

ml/min ▼

Back Flow

ml/min ▼

Set feeding pressure of calibration oil:
0,8 Bar
Set SCV current 0 A
Set test bench rotation speed: Test1 RPM
Set rail pressure: 1200 Bar
Measure pump delivery and enter the value
into the results section

634,7

447,7

316,7

500

290

Process Status: Ready   Device status: Device not connected   Data: No Data

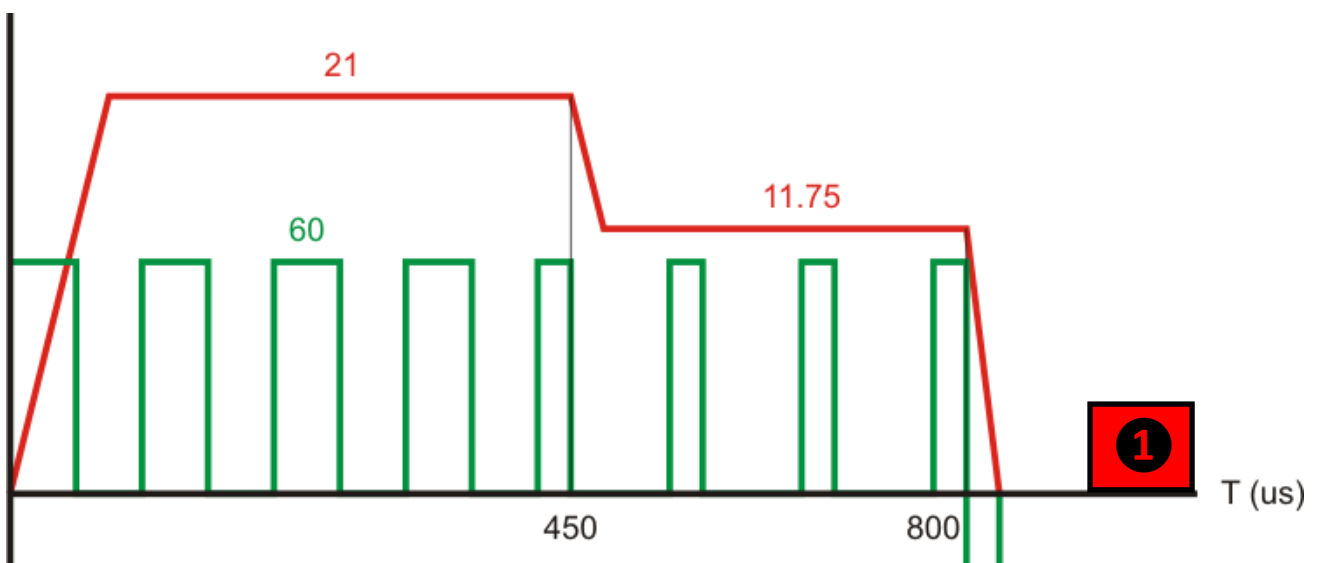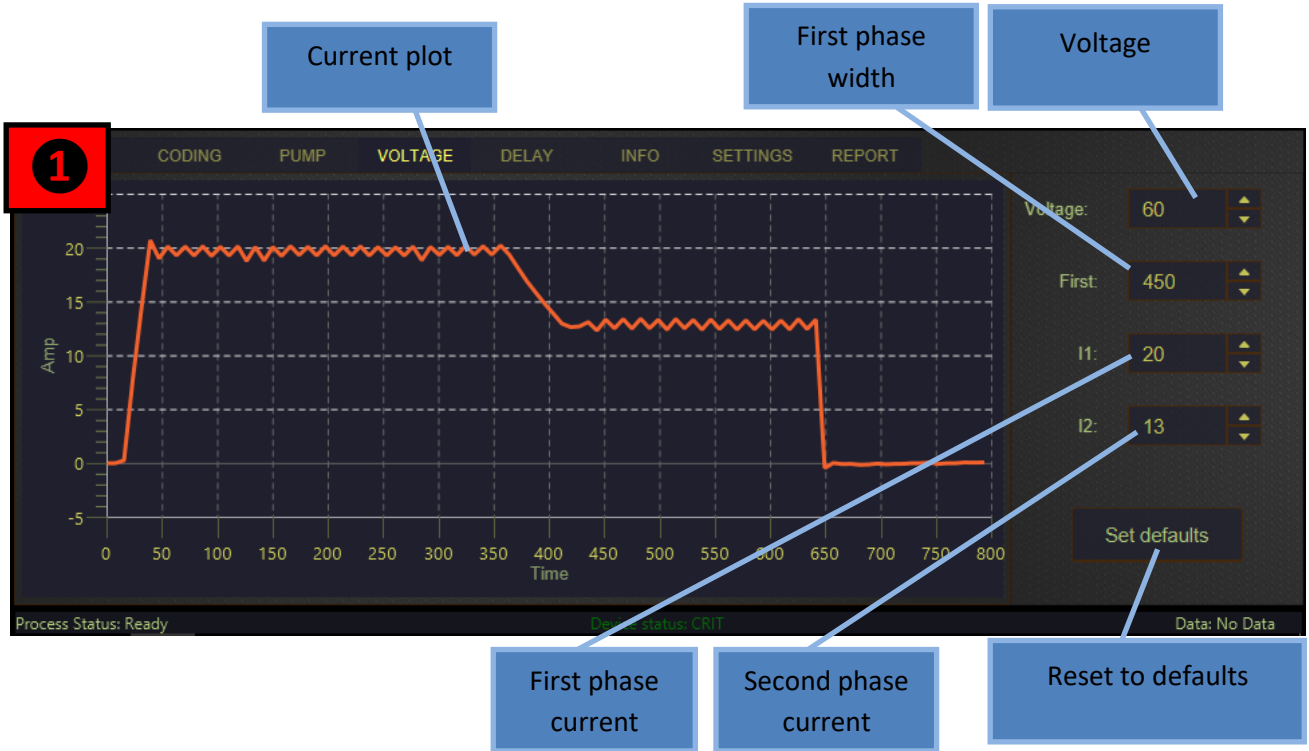Delivery value

Back flow value

Test info field

This section serves for measuring flow and backflow of the pump, and also contains a information field describing procedures and parameters of the pump test.
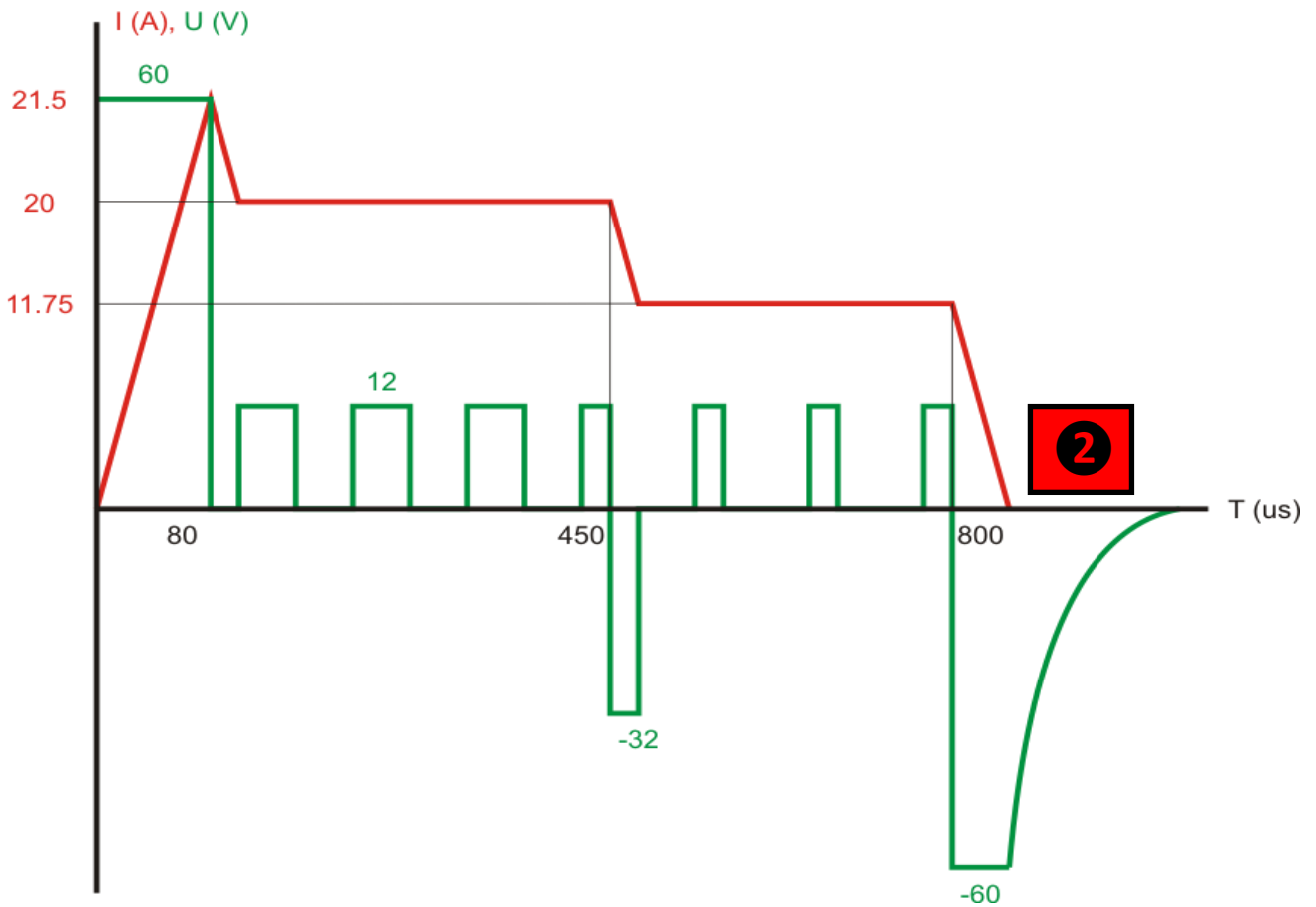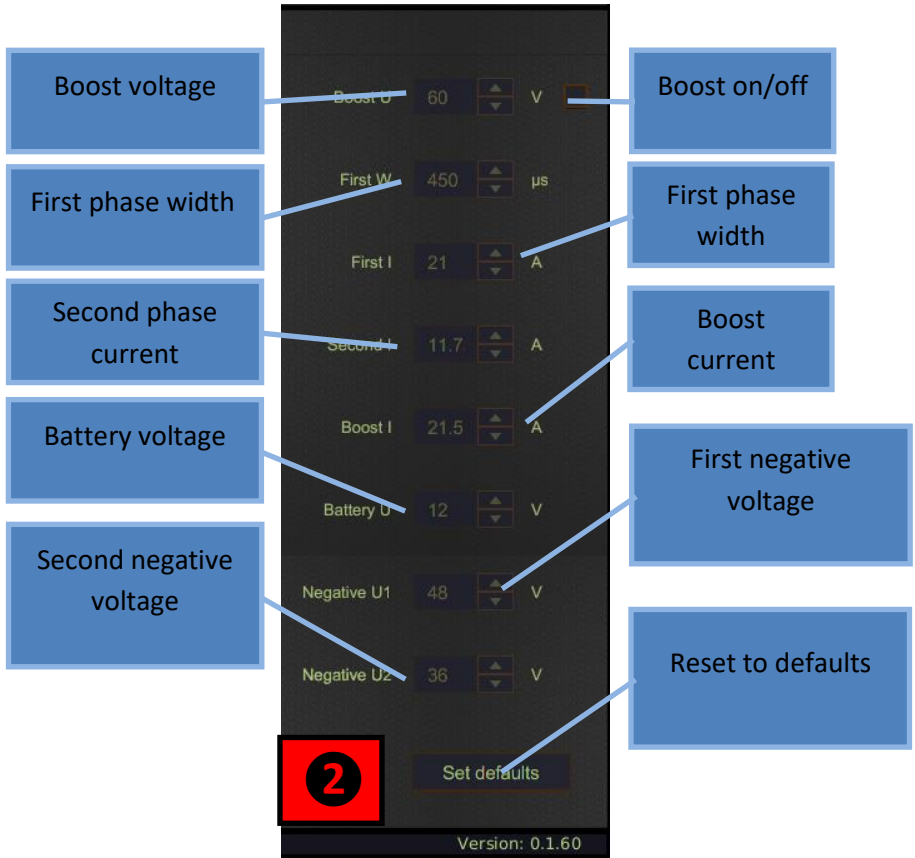
When using STARDEX devices with electronic measuring system (STARDEX 0305, 0306, 0104, STARDEX Ultima, STARDEX Dimas, STARDEX Stream) the flow and backflow measurement is automatic. The flow measurement data is saved in the report when clicking the STORE button in the main section. When clicking RESET button in the main section, this measurement is reset and the measurement process starts again.

For convenience the units of measurement can be changed from ml/min to l/hour.

Additional section. Current graph and current-voltage characteristics

Current plot

First phase width

Voltage

First phase current

Second phase current

Reset to defaults

Boost voltage	Boost U	60	V	Boost on/off
First phase width	First W	450	µs	First phase width
	First I	21	A	
Second phase current	Second I	11.7	A	Boost current
Battery voltage	Boost I	21.5	A	
	Battery U	12	V	First negative voltage
Second negative voltage	Negative U1	48	V	
	Negative U2	36	V	Reset to defaults

❷

Set defaults

Version: 0.1.60

The current chart of the injector serves as an additional tool for analyzing the fault of the injector. An abnormal graph may indicate short-circuited turns in the electromagnet or breakdown of the piezoelectric element of the injector.

Also, the current graph serves as a tool for monitoring settings of the current-voltage profile.

The first group figures show the current-voltage profile for devices of the previous generation STARDEX 0303, 0304, 0305, 0306, 0402, 0403.

The second group figures show the current-voltage profile for devices of the new generation STARDEX ULTIMA.

Changing profile settings is recommended only for advanced users. In rare cases incorrect values of currents and voltages can cause failure of the injector or simulator!!!

Creating and editing a test plan

It is very important to set the type of injector, current and voltage correctly. Wrong choice can damage the injector and simulator!!! Changing or creating new volt-amperage profiles is recommended only to experienced users!!!

There are existing testplans and current-voltage profiles that can be changed or new testplans and current-voltage profiles can be created. Click button NEW to create new or copy existing profile/testplan.

No changes can be made in the current database, all changed and new profiles/testplans are stored in CUSTOM folder in the list of manufacturers in the main section.

EDIT, SAVE, "+", "-" buttons are used to edit and save testplans from the CUSTOM folder.
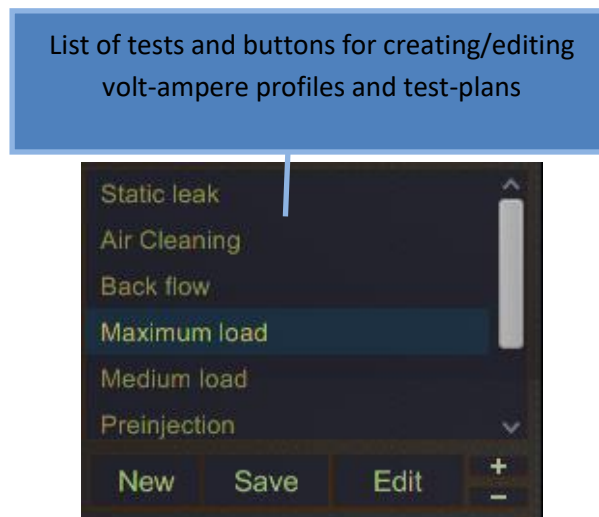
Clicking NEW button opens the window for creating a profile. Using buttons NEW and COPY in creating/changing the profile form, the user determines whether he creates a new profile or a copy of the existing profile.

When creating a new profile, the user sets all values of currents and voltages, as well as the type of injector by himself.

When creating a profile copy, all form fields are automatically filled with values from the profile of the selected injector.

There are 3 types of injectors: COIL (Bosch, Delphi, Denso, Caterpillar, AZPI), PIEZO (Bosch, Denso, Siemens), NEG_PIEZO (Delphi piezo).

ADD VA PROFILE button is used to change the values of currents and voltages and save these values to a user profile.

REMOVE VA button deletes the existing user profile.

Click OK button to finish creating the testplan in the CUSTOM folder or CANCEL button to cancel.

After creation / editing of the profile, the newly created number of injector is automatically chosen. After, the existing tests can be edited using EDIT button. The tests can be added / removed using "+" "-" buttons.

SAVE button in the main section quickly enters all the values from the right side of the screen into the test point creation / editing form. Target motor speed, target pressure, pulse width and frequency are automatically transferred.

When clicking ADD button, the test is added to the test list and can be edited again using EDIT button or deleted using "-" button.

Additional section. Injection delay
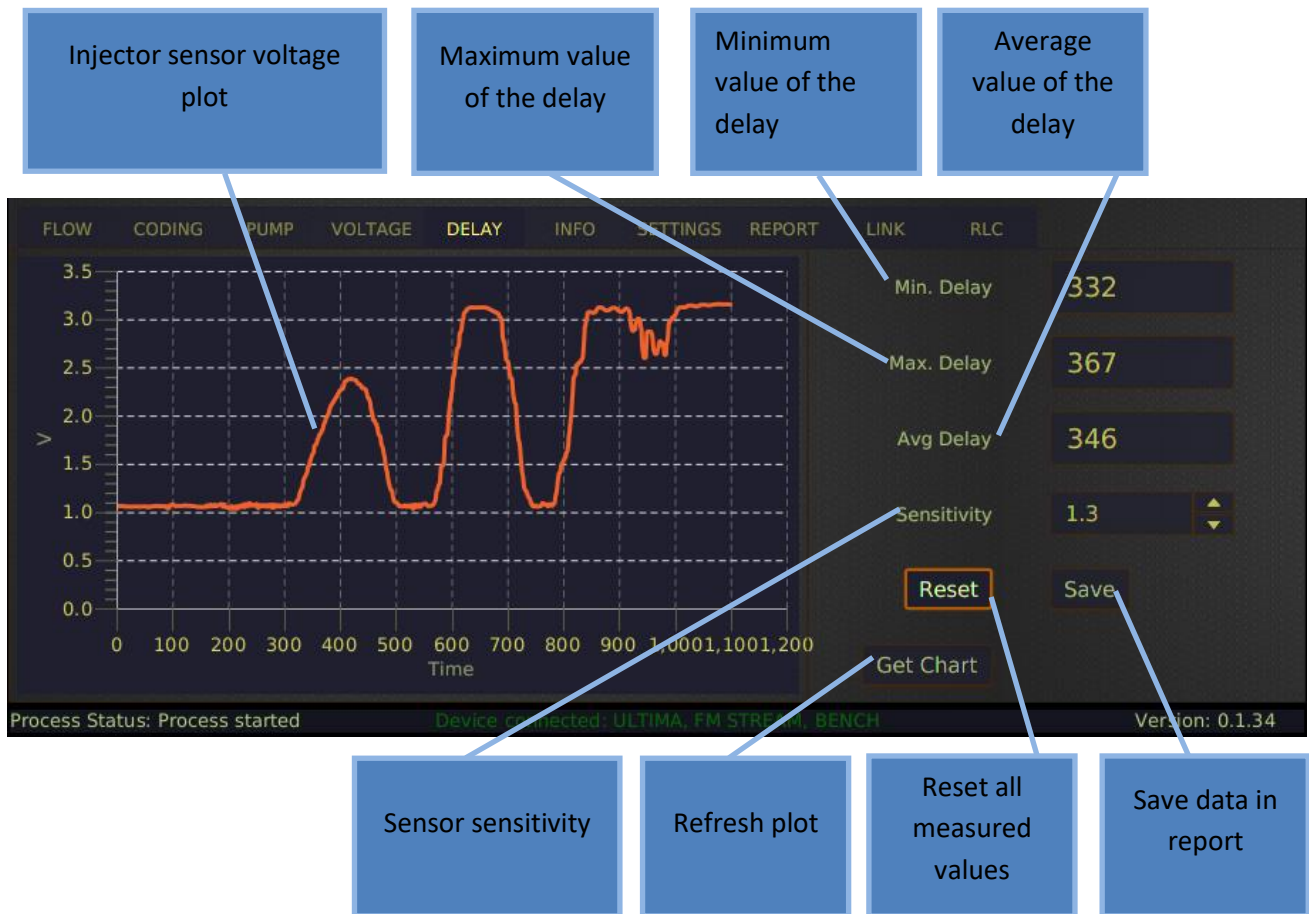
If the simulator is equipped with an output to the injection delay sensor or STARDEX 0502 is connected to it, the tab DELAY appears in the additional section.

On the voltage plot from the sensor, you can see where the injection started. This is always the first front. SENSETIVITY parameter sets the signal level. The projection of the cross point between the first front and the signal level (in this case 1.3 volts) to the Time axis is the value of the injection delay.

The received minimum, maximum and average values of the injection delay can be reset or saved in the report with the corresponding buttons.

GET CHART button refreshes the voltage chart.

Additional section. Information

The additional information section contains information on the applicability of the product, cross references, spare parts numbers, as well as information on assembly strokes, dimensions, gaps.
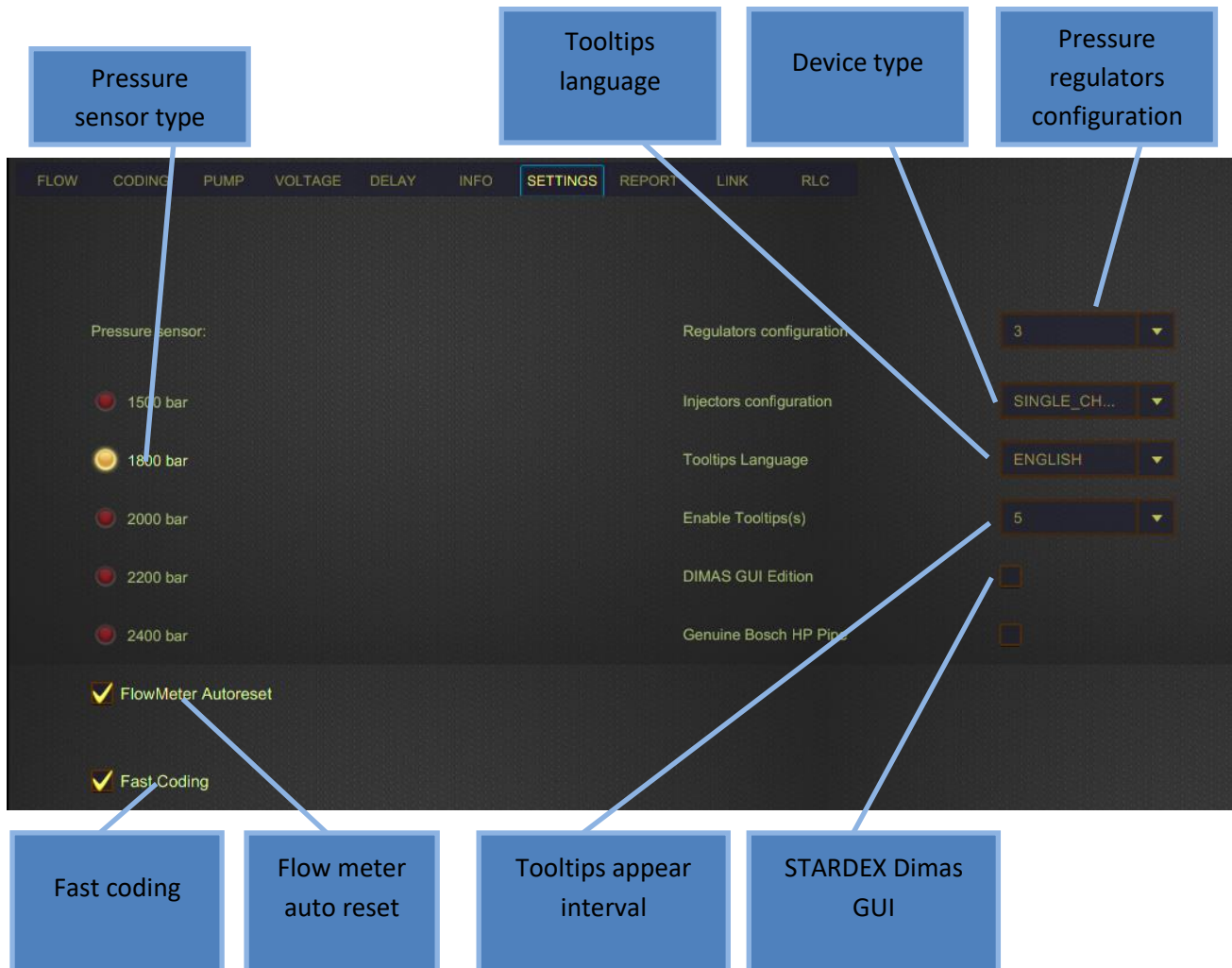
For some injectors, there is a detailed description of the location and purpose of the shims. This window is opened by clicking SHOW DETAILS button.
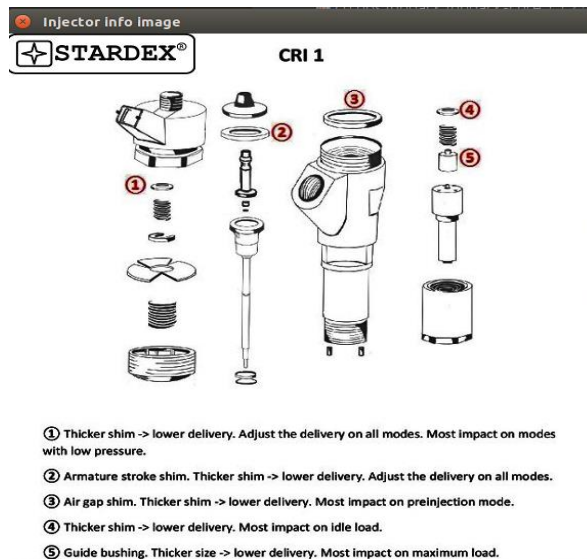
Depending on the type and number of the selected product, the information may look different!!!

Additional section. Settings

Typically, the user goes to the settings once when the device is first started.

The type of pressure sensor must be selected in accordance with the pressure sensor installed on the fuel rail.

In the regulator configuration, it is necessary to set the number of pressure regulators in accordance with the simulator used. Their number can be from one to three.

In the injectors configuration, it is necessary to set the number of injectors in accordance with the simulator used. Their number can be from one to six.

The main language of the program is English, but tooltips for components can be displayed in different languages. Select the desired language from the appropriate

list. In order for the tooltips not to interfere with your work, set the convenient interval for their appearance on the screen using the corresponding menu item.

If you use the STARDEX DIMAS or DIMAS ULTIMA bench work, check the corresponding box. This option removes the possibility of changing the rotation direction of the bench pump.

To automatically reset the flow meter values when changing tests, check the corresponding menu item.

To reduce the coding time of the injectors, by decreasing the accuracy, check the corresponding box.

Additional section. Report

Test Name	Delivery/BackFlow	Nominal Flow Range	1	2	3	4
Back flow	Back Flow	17.0-77.0 ml/min	47.5	-	-	-
Maximum load	Delivery	37.0-45.0 ml/min	44.0	-	-	-
Medium load	Delivery	14.7-19.7 ml/min	14.6	-	-	-
Preinjection	Delivery	0.4-3.0 ml/min	3.2	-	-	-
Idle load	Delivery	3.6-6.8 ml/min	6.0	-	-	-

Test Name	Units	1	2	3	4
Maximum load	µs	342	-	-	-
Idle load	µs	334	-	-	-

Parameter Name	Units	1	2	3	4
Inductance	µH	77.92	-	-	-
Resistance	Ω	0.39	-	-	-

Make sure to use injector's manufacturer ge

Process Status: Ready   Device conne

During the injectors test in AUTO or TESTPLAN mode, or during the pump test in TESTPLAN mode, a result report is generated. The first are the results of the flow tests; the data of the injection delay is in the middle; resistance, capacitance and inductance measurements are located at the bottom of the report.

The report contains test names, limit ranges of values and values obtained as a result of tests.

The measurement results are stored in the report by clicking STORE button in the main section or at the end of the MEASURING TIME. When redoing any of the tests, the result of this measurement in the report is overwritten.

Print the report. Company info on a printed form

In CUSTOMER tab, the customer data fields, testing date and serial numbers of the tested products should be filled in.

In COMPANY tab, the fields should be filled in with company data. The company logo can also be changed or deleted here. The logo should be in JPG or PNG format.

All saved PDF reports are stored in REPORTS folder on the desktop.

The report can be printed or saved in PDF, using the corresponding buttons at the bottom of the form.

Pump test

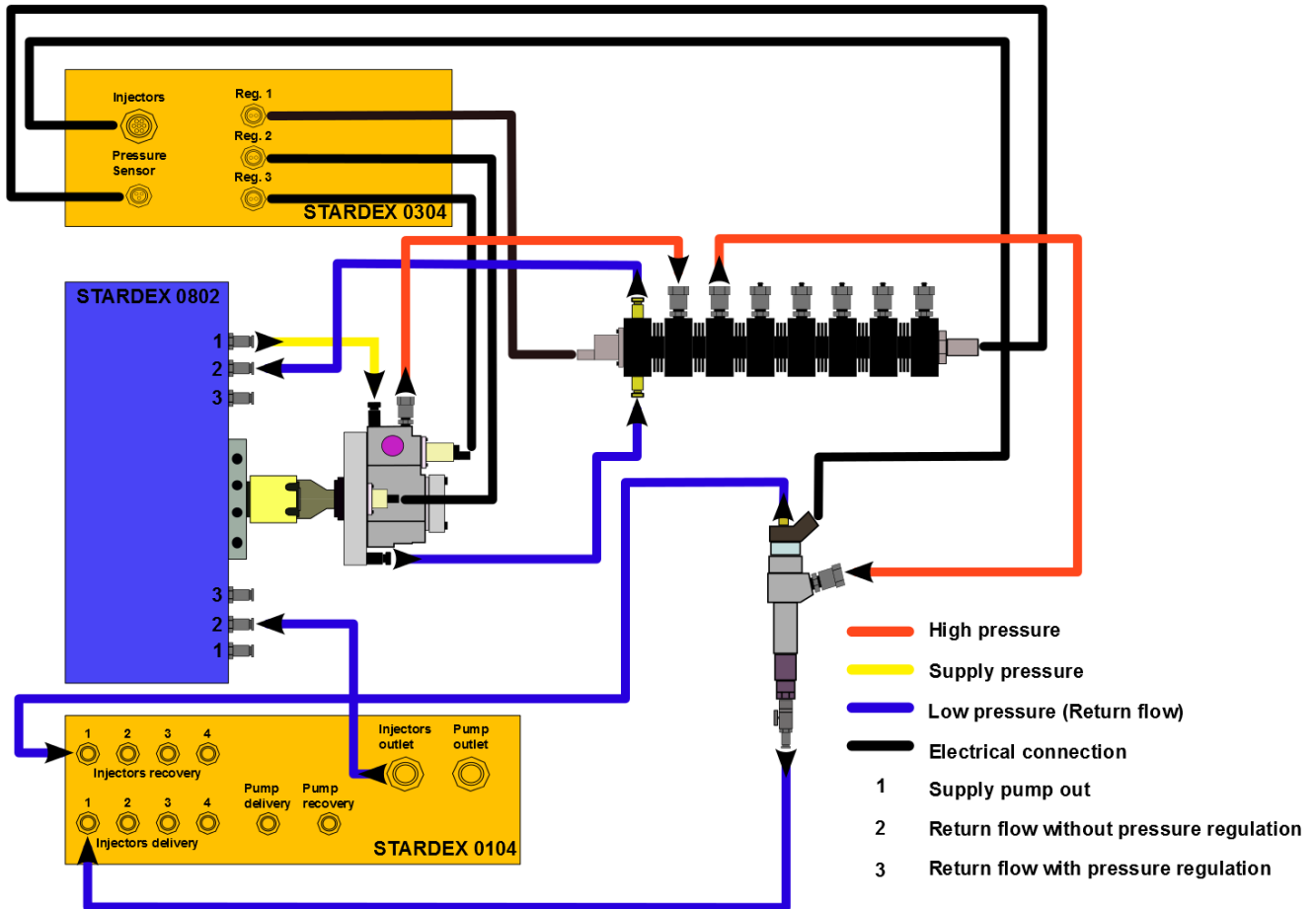Wiring diagram STARDEX 0803 + STARDEX 0304 + STARDEX 0104
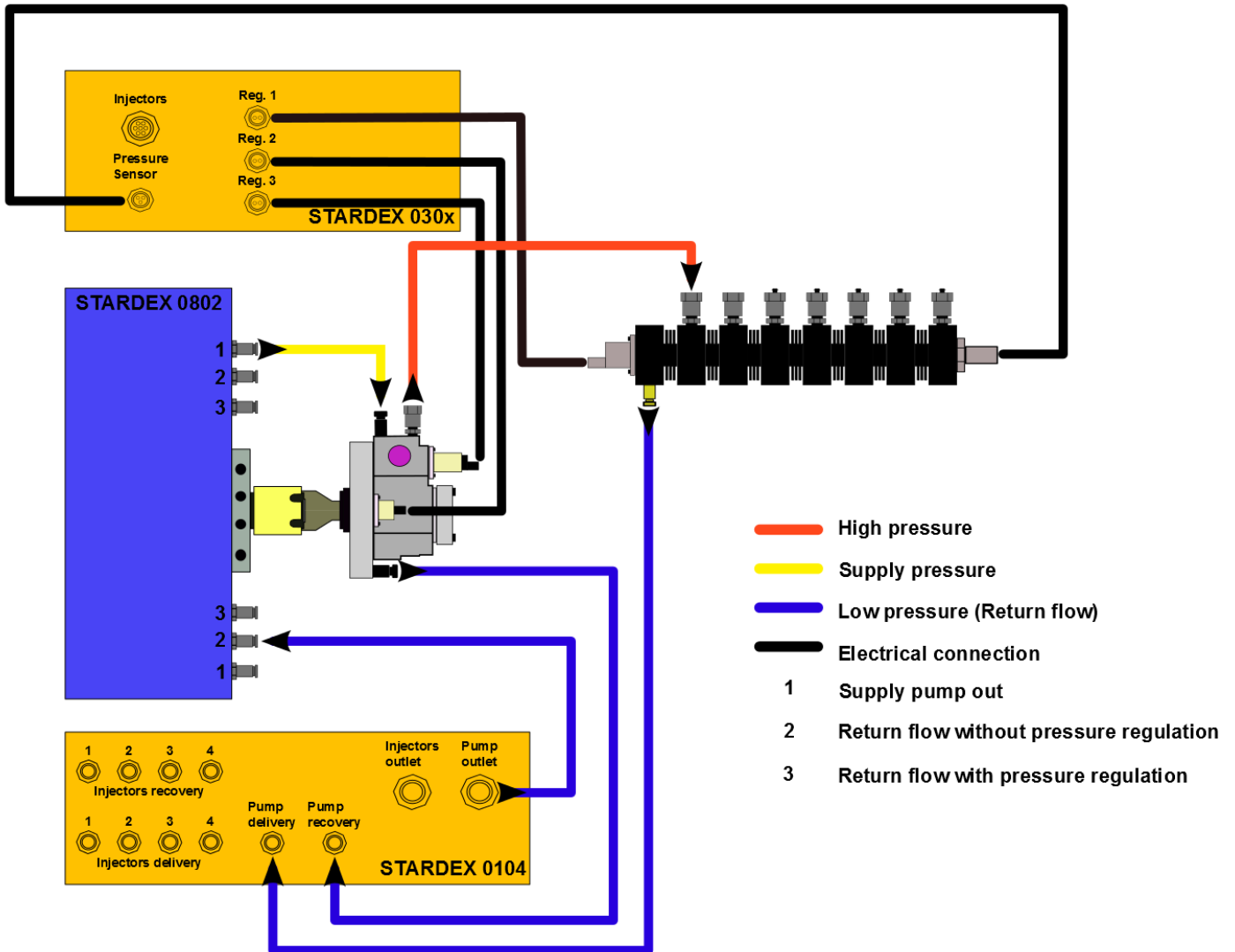
Install the Common Rail pump and the fuel rail on the bench as shown on the diagram above. Connect STARDEX 0803 work bench and STARDEX 0104 flow meter with USB cable to STARDEX 0304 simulator. In STARDEX SISU program, select the manufacturer and serial number of the tested pump. Set the rotation direction of the pump in the program according to the installed pump. Set supply pump to the AUTO or ON mode. On the additional panel go to the PUMP section and follow the instructions in the information field. To start the test, select the test and click START button in the main section. To save test results in the report, click STORE button in the main section.

To print a report, save to PDF, enter company data and customer data click PRINT button in the main section and additional window will appear.

When working on a bench with high pressure, it is necessary to use a protective cover in order to avoid personal injury in case of emergency situations!

Injector test

Wiring diagram STARDEX 0803 + STARDEX 0304 + STARDEX 0104

Install the Common Rail pump, fuel rail and test injectors on the test bench as shown in the diagram above. Connect STARDEX 0803 bench and STARDEX 0104 flow meter with USB cable to STARDEX 0304 simulator. In the STARDEX SISU program, select the manufacturer and serial number of the tested injectors. Select the test mode. Set the rotation direction of the pump in the program according to the installed pump. Set supply pump to the AUTO or ON mode. With the injector selection buttons, activate the connected injectors according to the numbered cable. In the additional section, open FLOW section. Click START button in the main section.

In AUTO or CODING modes tests are carried out from the beginning to end in order without user intervention. At the end of the process, a report or new codes of injectors are generated.

In TESTPLAN mode tests are selected from the list and started by the user. The results of the test are stored in the report when STORE button is clicked or automatically after the end of MEASURING TIME.

MANUAL mode is only for experienced users. It is used to reproduce specific test conditions. Saving results in the report is not available.

To print a report, save to PDF, enter company data and customer data click PRINT button in the main section and additional window will appear.

When working on a bench with high pressure, it is necessary to use a protective cover in order to avoid personal injury in case of emergency situations!