LABA7 Shock Dyno
User Manual

Lithuania 2025

Table of Contents

1. Introduction

Dear Customer,

Thank you for purchasing this product.

To ensure this condition and ensure safe operation, you must observe these operating instructions!

Read the entire operating instructions before using the machine for the first time. Observe all operating instructions and safety instructions!

UAB LABA7
Giluzio st. 15
Vilnius
Lithuania

2. Safety Information

- This manual is designed to be used in conjunction with the service manual and documentation provided by the shock absorber's manufacturer.
- Make sure to read and understand the whole user manual before using the Shock Dyno (further – device).
- The device works under excessive force, therefore, wear protective eyewear and take all cautions required to work in a safe environment.
- Connect the Shock Dyno to a grounded power socket.
- Only use the electric cord provided with the device.
- Do not use the power cord if it is pinched, sheared or cut.
- Do not use any power adapters if the plug doesn't fit your wall socket.
- Do not use an extension cord.
- The power socket to which you are connecting the Shock Dyno needs to be easily accessible to be able to unplug it in an emergency easily.
- Do not operate nearby an open flame or heat source.
- Place on a flat and level surface.
- Do not place in a highly corrosive or humid environment.
- Do not use the device or any of its components if they have been damaged.
- Do not perform any maintenance while the device is plugged into the mains.
- Make sure that the safety doors are closed adequately before running a test.
- Do not open or tamper with the safety lid or any other machinery parts during live operation.

3. Highlights

Congratulations on your purchase of the LABA7 Shock Dyno!

- Our fully automatic dynamometer allows you to test the mechanical force transmitted through any shock absorber as well as measure a multitude of variable factors pertaining to velocity, displacement, and other impacts, such as bump stops and even gas pressure. It does not matter which discipline you are working with – MTB, Motorcycles, Cars, 4X4, ATVs – all shocks can be tested. This machine is straightforward to use, and you can get the most accurate results immediately on your complimentary software/monitoring app.
- Shock absorber testing – Check if you have the right shock for the right use case or performance. Additionally, you can test whether the same shock is being kept throughout the travel. The device can also be used to compare two different shock absorbers.
- Test bump stops – Check the shock rate of your bump stops to develop an accurate quality estimate of different factors such as suspension sag, body roll, and cushioning for the driver.
- Parts tested – Empty shocks/Shocks with springs/Forks with springs/Forks with air springs/Bump stops/ Gas pressure force.
- High-accuracy force/pressure sensors.

4. Technical Specifications

Below are the specifications of each individual Shock Dyno model:

Featherlight Shock Dyno:

- Speed 8 - 1900mm/s
- 10000N load cell
- Adjustable stroke 25 - 100mm
- 3HP-230V electric motor (110V available on request).
- Scotch-yoke system for accurate linear motion
- Mast length 130cm

Light Shock Dyno:

- Speed 7 - 2600mm/s
- 10000N load cell
- Adjustable stroke 25 - 150mm
- 4HP-230V electric motor (110V available on request).
- Scotch-yoke system for accurate linear motion
- Mast length 130cm

Mid Shock Dyno:

- Speed 7 - 2600mm/s
- 15000N load cell
- Adjustable stroke 25 - 150mm
- 5HP-380V electric motor
- Scotch-yoke system for accurate linear motion
- Mast length 130cm

Heavy Shock Dyno:

- Speed 8 - 3000mm/s
- 15000N load cell
- Adjustable stroke 25 - 150mm
- 10HP-380V electric motor
- Scotch-yoke system for accurate linear motion
- Mast length 130cm

5. Know Your Shock Dyno

5.1. Overview

The overview of the LABA7 Shock Dyno Feather and Light models is presented in the image (Figure 1) below:

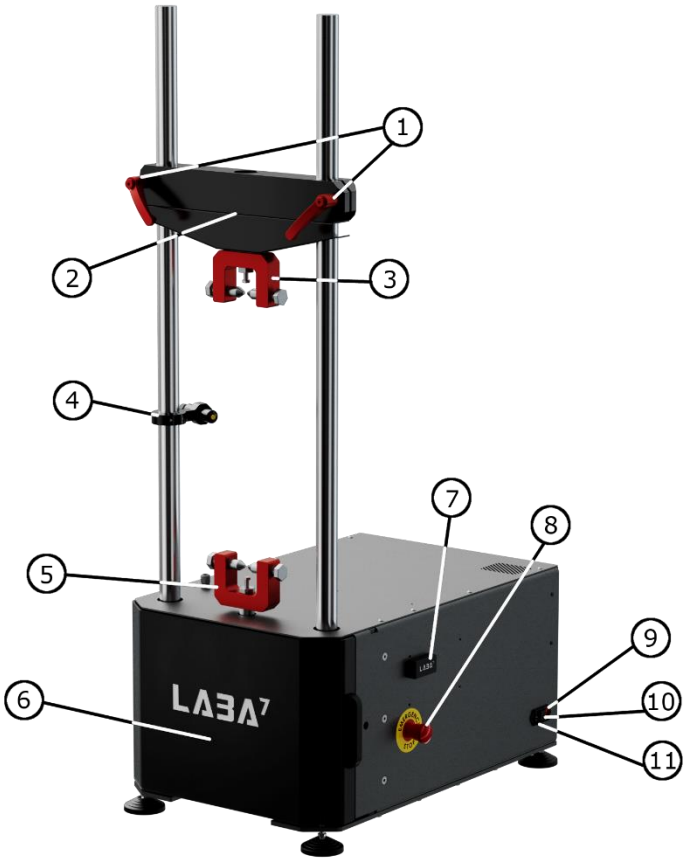


Figure 1

1. Crossbar handles.
2. Preload crossbar.
3. Top mounting bracket.
4. Temperature sensor.
5. Bottom mounting bracket.
6. Safety cover.
7. USB connector.
8. Emergency stop button.
9. Power switch.
10. Fuse.
11. Power cable connector.

The overview of the LABA7 Shock Dyno Mid and Heavy models is presented in the image (Figure 2) below:

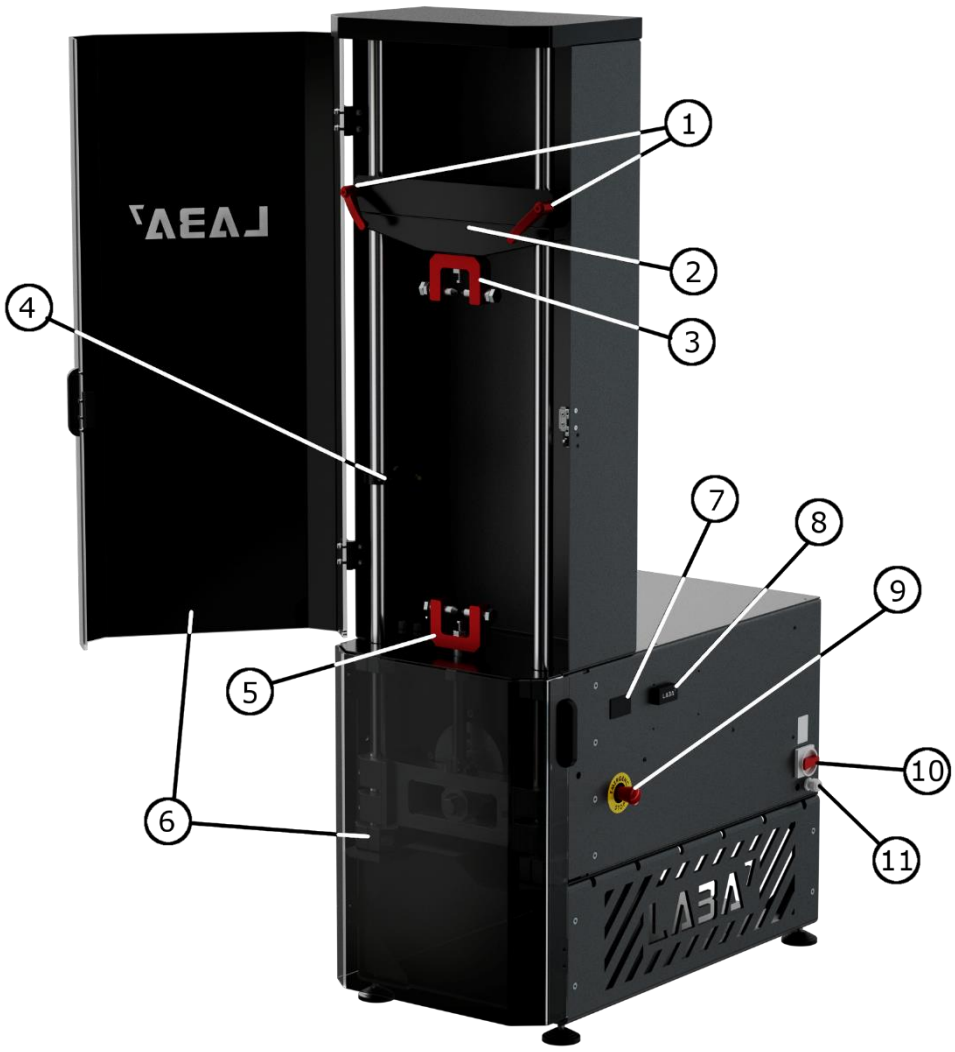


Figure 2

1. Crossbar handles.
2. Preload crossbar.
3. Top mounting bracket.
4. Temperature sensor.
5. Bottom mounting bracket.
6. Safety covers.
7. Manual Dyno controller.
8. USB connector.
9. Emergency stop button.
10. Power switch.
11. Power cable.

5.2. Emergency Stop Button Control

The Emergency Stop button can be activated anytime during operation. To activate the emergency button:

1. Press the button to stop any operation.
2. Rotate the Emergency Stop button to the right to release it and deactivate the emergency state.

5.3. Manual Control

Shock Dyno Mid and Heavy models can be controlled via a manual dyno controller:

1. Adjust the motor frequency by rotating the knob on the manual display.
2. Press the RUN button to start the Dyno.
3. Motor frequency can be adjusted while the Dyno is running.
4. Press the STOP button to stop the Dyno.

ATTENTION: Use the emergency stop button to engage the safety mechanism before opening the protective lid or removing shocks or forks to disable the Dyno from running by accident and prevent the risk of injury.

6. Accessories

6.1. Adapters

Here you will find various adapters compatible with the Shock Dyno.

Universal Clamp Assembly

- Fits many different shock absorbers
- 74mm clearance
- Can be used for both top and bottom mount
- 3-way locking bolts for extra stiffness

Figure 3

Self-Preload Assembly

- Fits shock absorbers with the external gas chamber
- 30mm clearance
- Easy preload mechanism
- Can be used together with a universal clamp
- 9.8mm mounting axis

Figure 4

Moto Fork Assembly

- One or two forks can be tested
- Adjustable offset
- Fits 20mm and 26mm axles
- Standard axle mount
- Stock inserts 54mm and 56mm
- Different size inserts on request

Figure 5

MTB Fork Assembly

- Fits steerer tube of 28.6mm
- Adjustable offset
- Fits 20mm and 26mm axles
- Standard axle mount
- Fits universal clamp

Figure 6

MTB Cartridge Assembly

- Fits universal clamp
- Fox 34/36/40 adapters
- Öhlins 36/38 adapters
- RockShox adapters
- Different size adapters on request

Figure 7

Trunnion Assembly

- Fits Trunnion shock absorbers
- Can be used with self-preload clevis
- Automatic alignment
- 2 locking bolts for extra stiffness

Figure 8

6.2. Adapter Installation

Whenever installing a new adapter into the Dyno or replacing an existing one, follow the steps below:

1. Make sure the Shock Dyno is powered off, or the Emergency Stop Button is engaged before changing the adapters.
2. Use a wrench tool to unscrew both vertical bolts to release the clamp heads. (Figure 9 – Step 1)
3. Switch to another adapter and use the same method to secure the bolts in place.
4. Release the Emergency Stop Button if previously engaged.

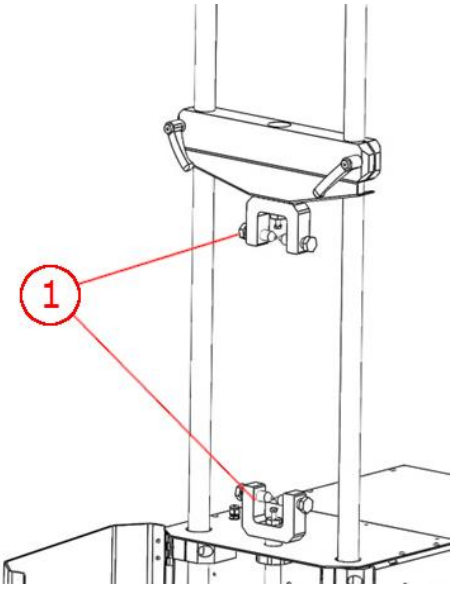


Figure 9

7. First Launch

This section provides information associated with the first use of the LABA7 Shock Dyno.

Follow the steps below to launch the Shock Dyno for the first time:

1. Plug the power cable provided with the device into the power connector and plug into the mains.
2. Turn the Shock power switch on. The green light on the switch will light up, or the manual dyno controller will light up.
3. If powering on the Shock Dyno results in the shortening of an earth leakage circuit breaker, follow the instructions of RFI Jumper Removal (Section 7.2) to solve the issue.
4. Press the Emergency Stop Button to disengage the Shock Dyno before mounting the damper.
5. Open the safety doors by pulling from the cover side handle.
6. Place the damper within the top or bottom adapter and secure it.
7. Adjust the handles of a preload crossbar and lower or raise it to align the damper with the other unsecured adapter and secure it in place.
8. Before tightening the preload crossbar, ensure the dyno mast is in its dead-bottom position (use a socket or spanner wrench to adjust the motor so it is placed bottom-wise during the start of rotation).
9. If your damper requires a different stroke on the Shock Dyno, follow Changing the Stroke (Section 7.1) instructions.
10. Preload the crossbar by pushing it downwards and tightening the handlebars.
11. Release the Emergency Stop Button.
12. Power off the Shock Dyno to configure the software.

7.1. Changing the stroke

Follow the steps below to change the stroke on the Shock Dyno. These steps apply to all the Shock Dyno models.

1. Press the Emergency Stop Button to disengage the Shock Dyno and prevent the motor from moving.
2. Rotate the roller bolt using a wrench (Figure 10 – Step 1) and insert the locking pin to lock the roller in place (Figure 10 – Step 2).
3. Unscrew the rolling bolt until it is loose.
4. Slide the roller to the side to mount it into a different hole on the flywheel.
5. Tighten the bolt and remove the locking pin to complete the stroke adjustment.

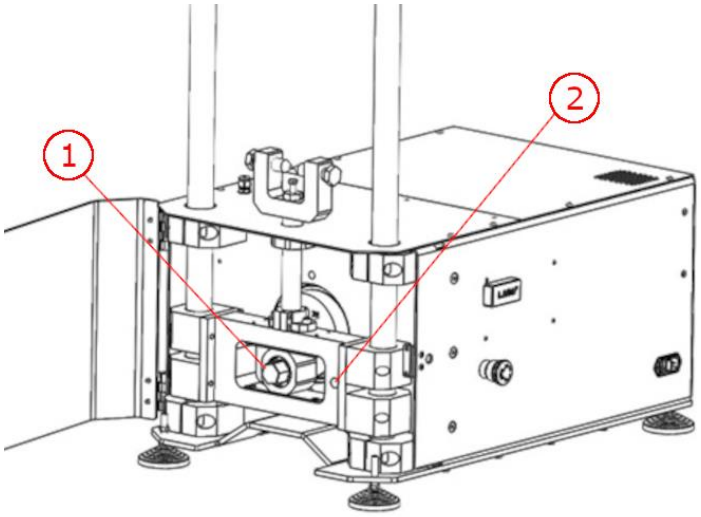


Figure 10

7.2. RFI Jumper Removal

If a power system that powers the Dyno has an earth leakage circuit breaker (RCBO), with the power on, it can break. In such cases, an RFI jumper must be removed from inside the Dyno.

The purpose of using the RFI jumper is to isolate the main power from the ground. If the AC motor drive is supplied from an IT or TN power system, the RFI jumper must be removed. This disconnects the RFI capacities (filter capacitors) from the ground to prevent circuit damage and reduce current leakage to the ground.

RFI Jumper is located on the AC Motor Driver:

Figure 11

This guide applies to all models of LABA7 Shock Dyno; however, there are two possible modifications of the AC Motor driver. This can result in a different RFI jumper, nonetheless the location and steps to remove it are similar.

The motor driver can be found inside the Shock Dyno. Remove the top cover using 4-6 screws (depending on the different Shock Dyno model).

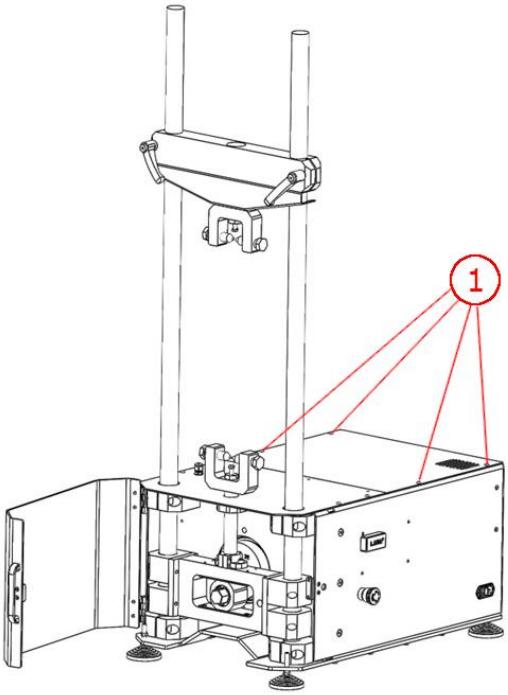


Figure 12

Once the cover is open, you should see the AC Motor driver on the side of the Dyno towards the back, next to the motor.

It is likely that the RFI pin (jumper) is located on the left side of the AC Driver. In that case, you will have to remove the 2 screws from the side of the Dyno that hold the plate on which the AC Driver is mounted.

Configuration 1:

The RFI jumper is on the side of the AC Driver and is held by a bolt.

To remove the RFI jumper, release the bolt holding the jumper. Remove the jumper. Tighten the bolt back.

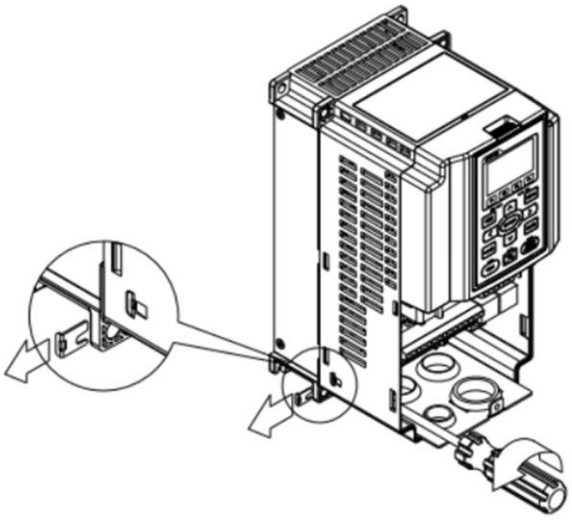


Figure 13

Assemble everything back and close the Dyno cover before powering on the device.

Configuration 2:

The RFI jumper is on the side of the AC Driver in a small hole. It looks like a small wire. To remove the RFI jumper, use pliers to cut the wire or pull it out.

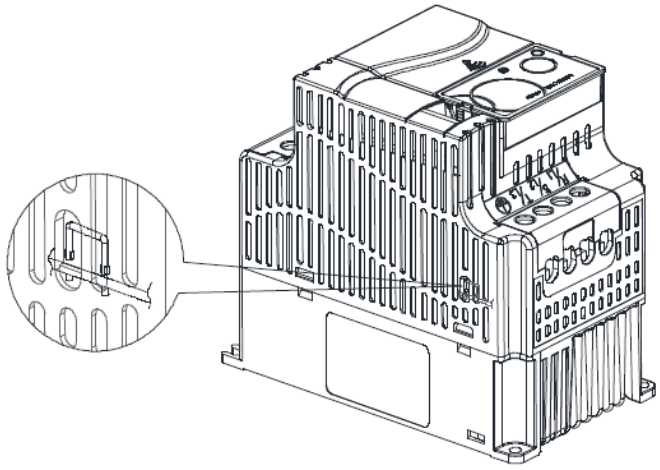


Figure 14

Assemble everything back and close the Dyno cover before powering on the device.

In case of any other questions regarding the wiring, please get in touch with LABA7 team.

8. Software Setup

8.1. System requirements

These are the minimum requirements for the app to function in conjunction with Dyno:

- Windows 7 (SP1), 8, 10, 11
- NET Framework 4.7.2
- 4 GB of RAM
- 1 GB of free disk space

8.2. Installation

Contact LABA7 support to receive the latest Shock Dyno software version.

1. Open the Shock Dyno software folder.
2. Locate the “Setup.exe” executable file and double-click to run the installation.
3. Once the setup panel has launched, click “Install” to continue.
4. Setup will install the program and automatically launch the software once the installation is done (a shortcut will be created on your desktop).

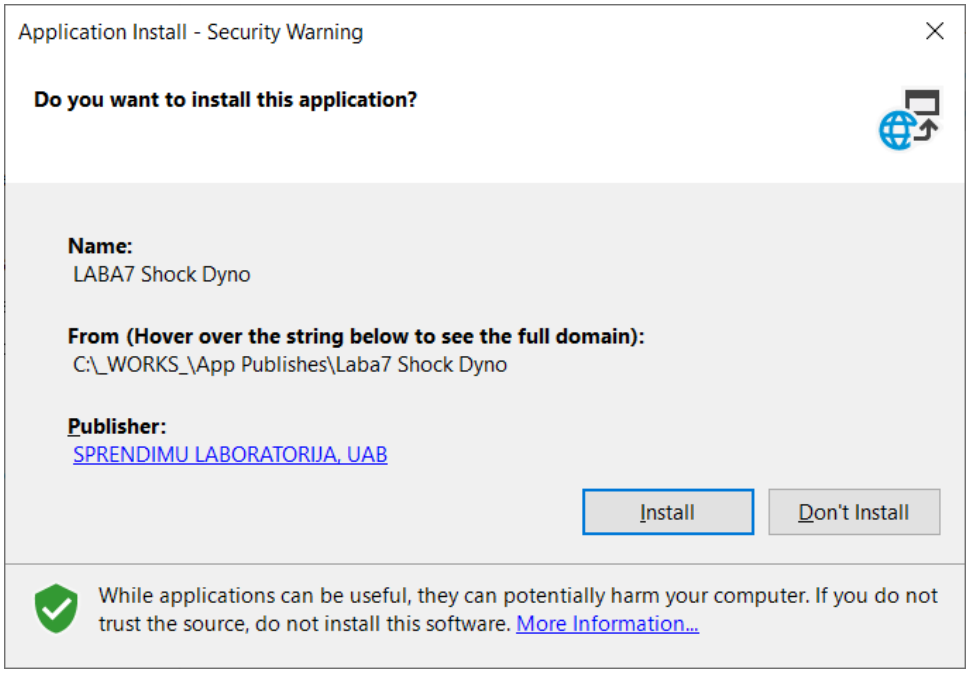


Figure 15

8.3. Configuration

After launching the application for the very first time, follow the steps below to configure the initial settings:

1. Keep the Dyno powered off.
2. Launch the application and go to the Settings page which is located in the top right corner.

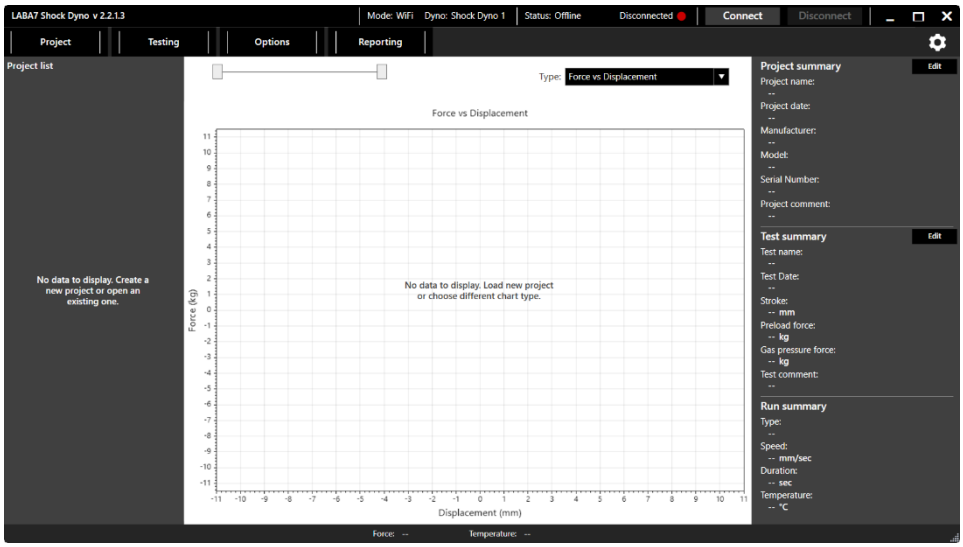


Figure 16

3. Select the default data catalog, this is the catalog, where all of your test project files will be saved.(Figure 17 – Step 1).

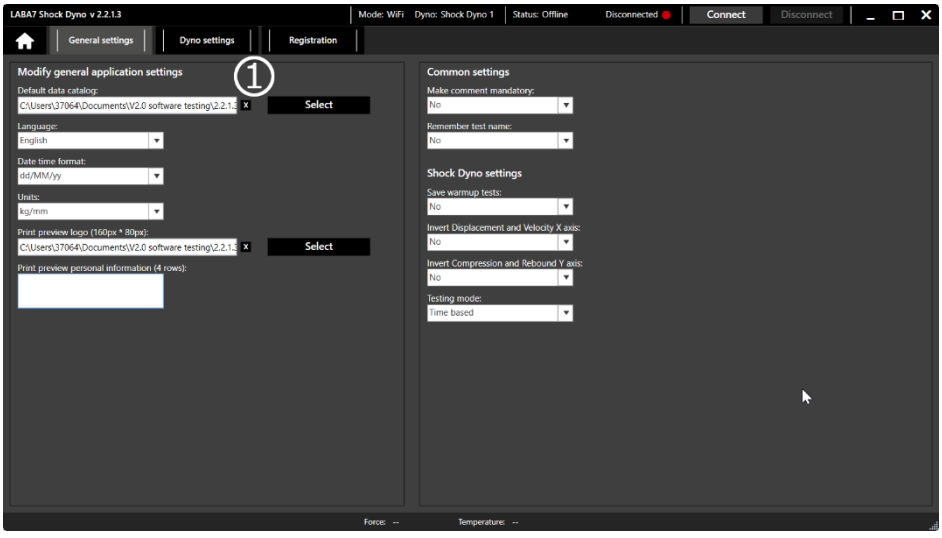


Figure 17

4. Go to the Dyno Settings tab.
5. Add a new Dyno model by clicking Add button (Figure 18 – Step 1).
    a. You can rename the model by double-clicking on the model's name in the Dyno list.
    b. Multiple models are used to switch between them during the operation quickly.

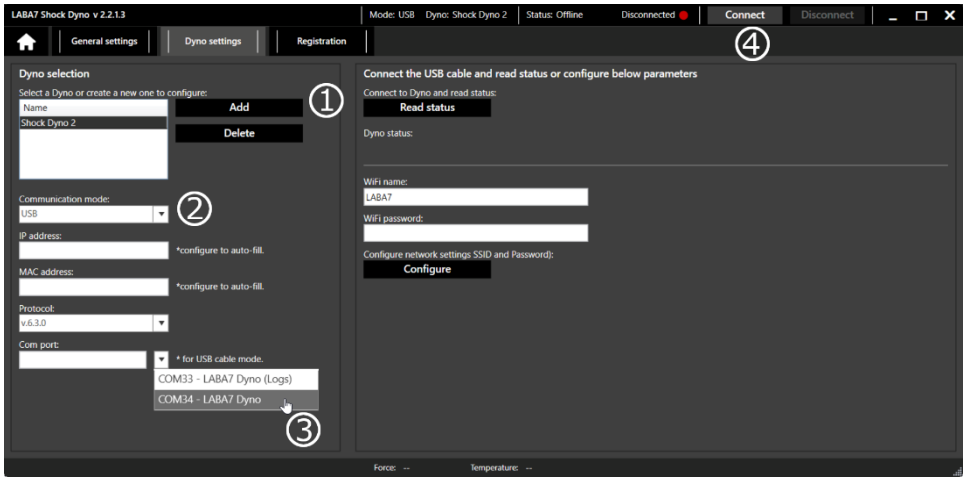


Figure 18

6. Turn on the Dyno if it was previously turned off.
7. Select Communication Mode by clicking on the drop-down menu (Figure 18 – Step 2):
    a) Wireless communication—Wi-Fi network is required in the workshop (no LAN connection is needed). Make sure the router is relatively close to the Dyno, and there are no obstacles to cause interference to the signal
    b) USB cable—the cable will have to be connected at all times during operation with the Dyno

8. Connect the USB cable to the LABA7 Dyno and the computer.
9. Wait 15-20 seconds for the Dyno to initialize.
10. From 2 newly appeared com-ports select COM6 - LABA7 Dyno (Figure 18 – Step 3).
11. Press Connect (Figure 18 – Step 4).

ATTENTION: Based on your preference, go to the next section for either wireless or USB communication setup.

8.4. Wireless Communication

This section indicates how to set up wireless communication between the Dyno and the computer. The following items should be considered when choosing this communication type:

- Up-to-date Wireless Router in the workshop to ensure a stable and fast connection for data transfer during the Dyno operation.
- Open area for a Dyno to operate with a router placed in a line-of-sight from the Dyno. Any object between the Dyno and the wireless router can negatively impact the wireless signal, resulting in poor signal quality.

Follow the steps below to configure the wireless communication:

1. Keep the Dyno powered off.
2. Launch the application and go to the Settings page.
3. Go to the Dyno Settings tab.
4. Connect the USB cable to the LABA7 Dyno and to the computer.
5. Wait 15-20 seconds for Dyno to initialize.
6. Press “add” (Figure 19 – Step 1).
7. Select USB communication mode (Figure 19 – Step 2).
8. From 2 newly appeared com-ports select COM6 - LABA7 Dyno (Figure 19 – Step 3).
9. Press “Connect” (Figure 19 – Step 4).
10. Enter Wi-Fi name and password into the corresponding fields (Figure 19 – Step 5).
11. Click on Configure button (Figure 19 – Step 6).
12. After successful configuration press “disconnect” (Figure 19 – Step 7).
13. Go back to step 2 and change the communication mode to “wireless“.
14. Press “connect” again (Figure 19 – Step 4)

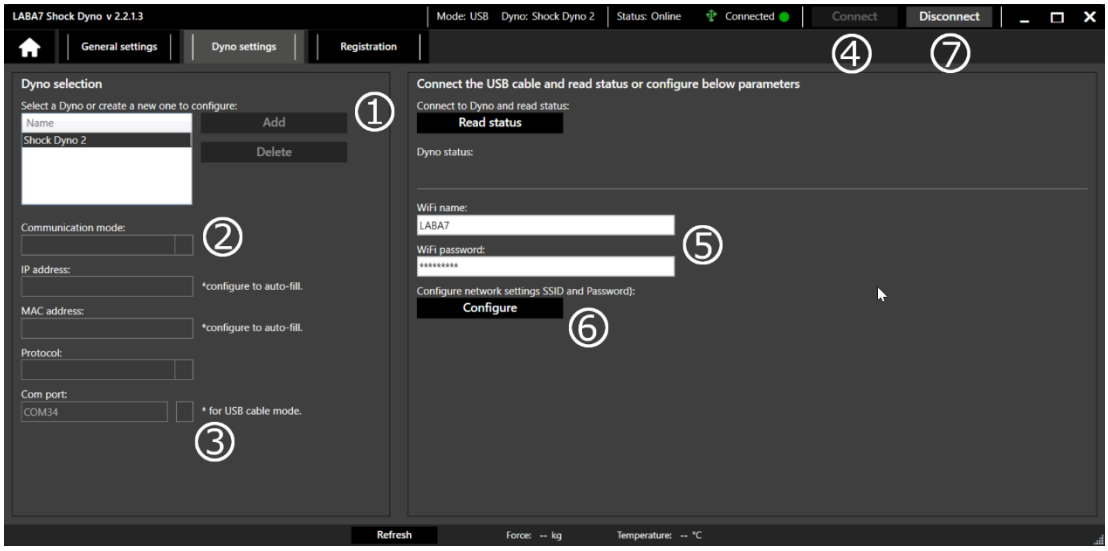


Figure 19

After a successful connection to the router, Dyno status should indicate connected to WIFI with a green indicator in the upper right application corner.

ATTENTION: If any of the steps fail or the Dyno is still not connected to the application, go to the troubleshooting section.

8.5. USB Communication

This section indicates how to set up a USB communication between the Dyno and a computer.

Follow the steps below to configure the USB communication:

1. Keep the Dyno powered off.

2. Launch the application and go to the Settings page.
3. Go to the Dyno Settings tab.
4. Connect the USB cable to the LABA7 Dyno and to the computer.
5. Wait 15-20 seconds for the Dyno to initialize.
6. Press “add” (Figure 20 – Step 1).
7. Select the USB communication mode (Figure 20 – step 2).
8. From 2 newly appeared com-ports select COM6 - LABA7 Dyno (Figure 20 – Step 3)
9. Press “connect” (Figure 20 – step 4).
10. Check the USB icon in the top right corner, it should be green .

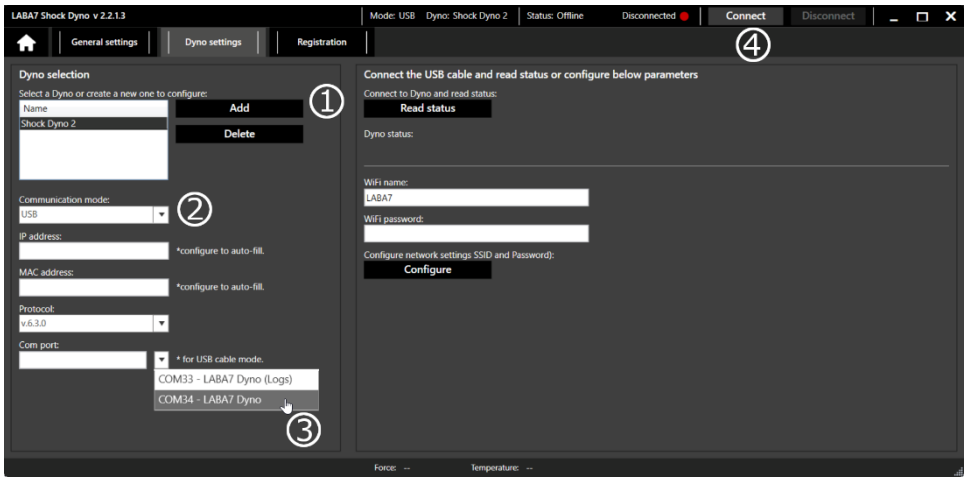


Figure 20

ATTENTION: If any of the steps fail or the Dyno is still not connected to the application, go to the troubleshooting section.

9. Software Operation

9.1. Main Menu

Once the application is launched, you will see the main screen with 5 separate buttons:

- Project - create new, open old projects and tests, import .csv.
- Testing – for new test configuration and execution.
- Options – tools for graph analyzation, test presets and other additional functionalities.
- Reporting – for report printing and data exporting.
- Settings – software and hardware configuration.

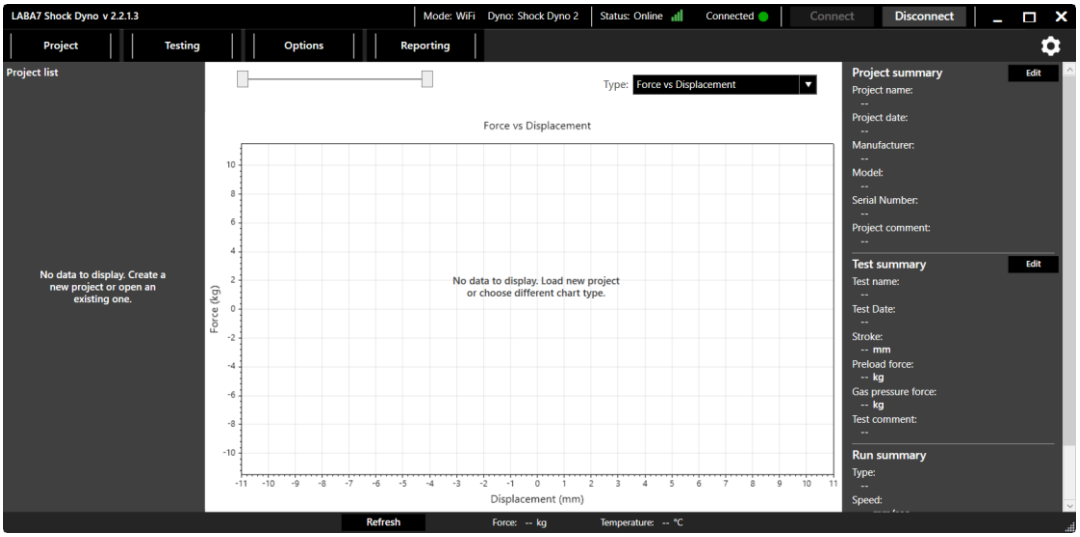


Figure 21

Additionally, you can check your software version, edit project summary, edit test summary, check Live dyno data such as temperature and current force. You can see which dyno is active and what communication method is being used as well.

9.2. New Project

Whenever a new damper is inserted into the Dyno, it is recommended to start a New Project. Locate project button in the top left corner, press it and then - press new project.

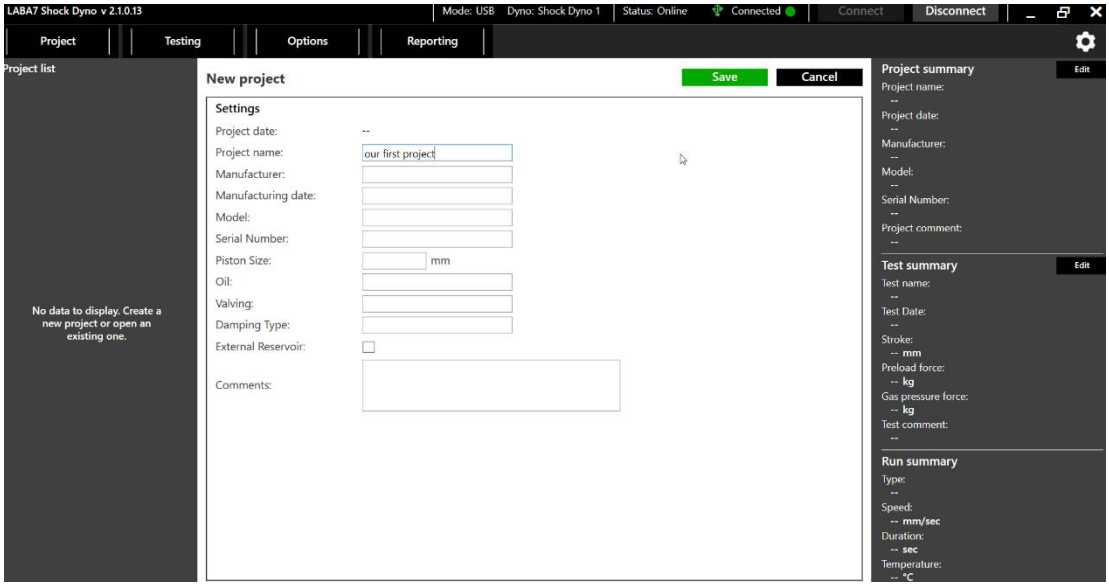


Figure 22

Enter the following information to proceed to the testing area:

- Project Name – the name of the project that will be tied to all the tests within this project.
- Manufacturer – manufacturer of the damper being tested.
- Manufacturing date – the date when the damper was manufactured.
- Model – model name of the damper which is being tested.
- Piston size – the size of the damper's piston.
- Oil – oil type which is being used in the damper.
- Valving – valving type of the damper which is being tested.
- Damping type – the damping type of the damper which is being tested.
- External reservoir – select if the damper has an external reservoir.
- Comment – comment about a project.

After all needed info is entered, press Save

9.3. Calibration

This section describes the calibration process of the dyno.

After the damper is installed and the project is created, dyno needs to be calibrated. To do this, locate the “testing” button in the top, you will see a window shown in Figure 23.

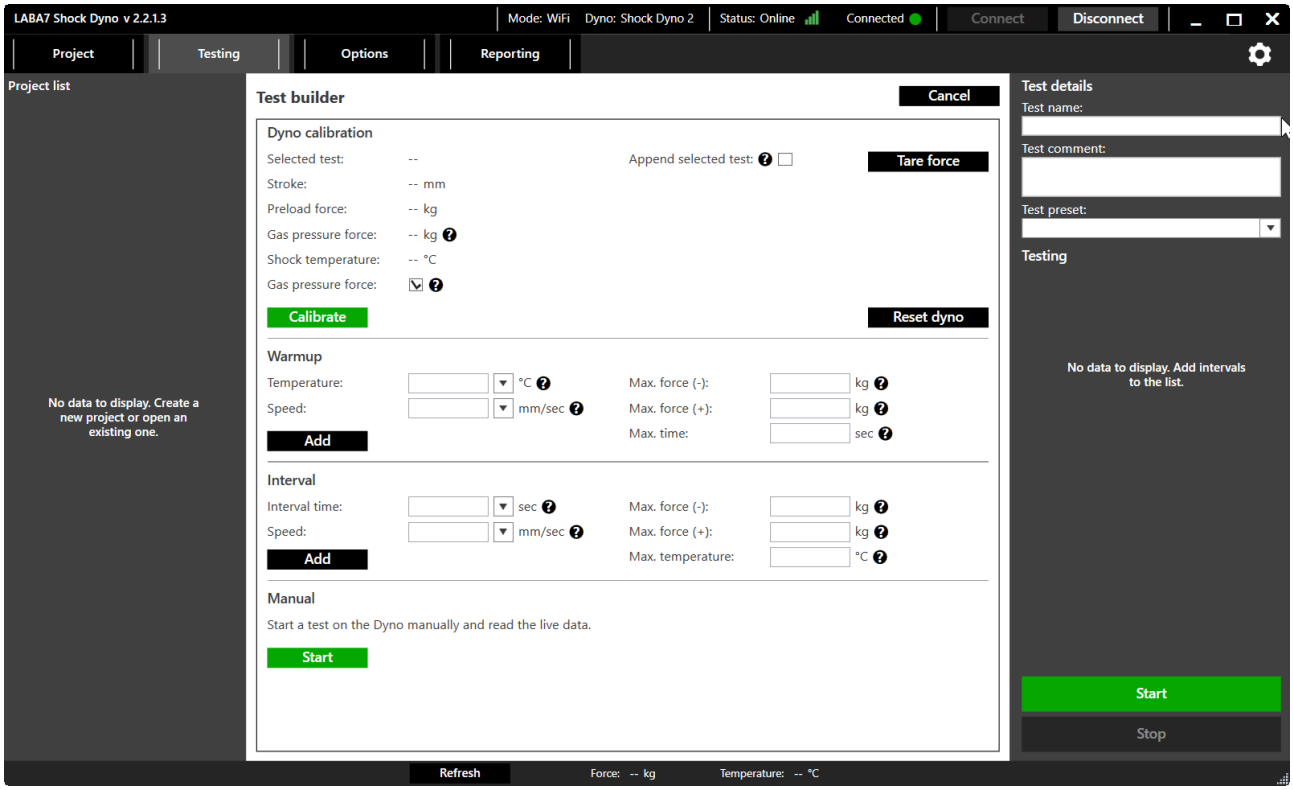


Figure 23

Make sure there is no interference for the dyno’s moving mast and press **Calibrate**
During the calibration dyno measures parameters such as:

- Adjusted stroke
- Preload force
- Gas pressure force (if the gas pressure force check-box is selected)
- Shock temperature

Additionally, you can click on the checkbox called “append selected test”, in this case, the stroke, preload force and gas pressure force from the selected test will be used.

If the user engages emergency button, after disengaging it, the emergency state has to be reset by clicking **Reset dyno** button. After that, tests can be continued.

If the user wants to tare the load cell, he is allowed to press **Tare force** . This step is recommended to be done, while the dyno is empty.

ATTENTION: Make sure the temperature sensor that is located on the Dyno (see section 5.1 Overview) is pointing directly to the body of a shock absorber. For reflective surfaces such as chrome, apply a piece of electric tape.

9.4. Creating intervals

After project is created, dyno is calibrated – it is time to make a first test in our project.

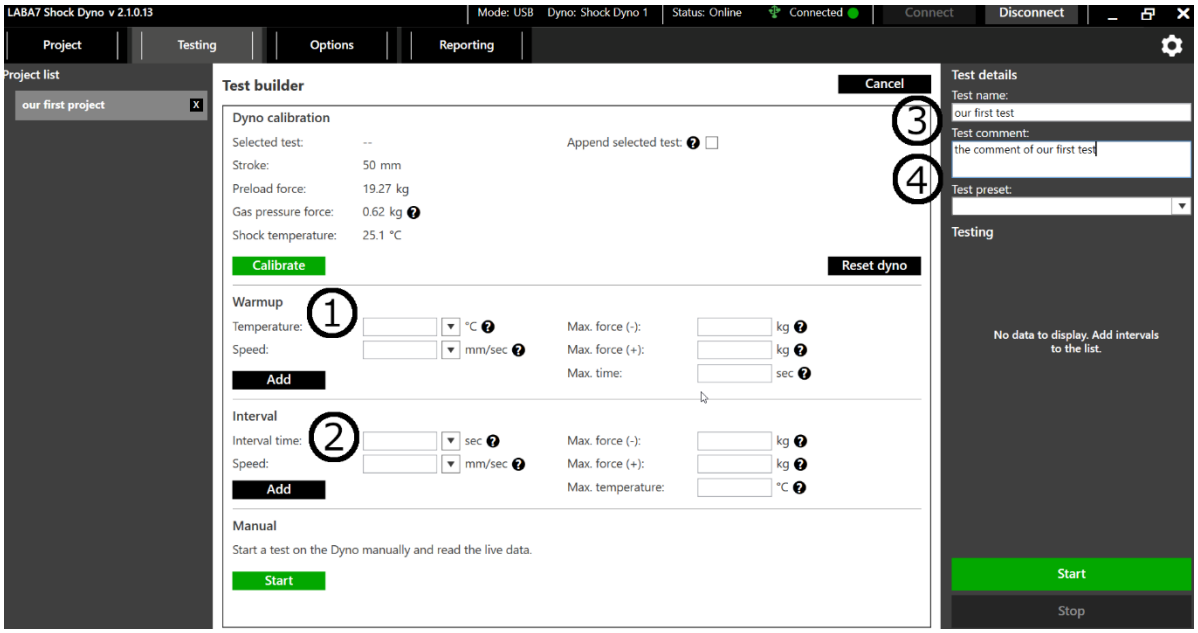


Figure 24

There are 2 interval types, which you can set in general settings:

- Cycle based intervals – intervals are based on cycles, 1 cycle is equal to 1 full rotation of the flywheel (compression and rebound)

- Time based intervals – intervals are based on time in seconds.

Testing includes 2 types of runs:

- Warmup – used to warm the damper to the working temperature (Figure 24 – Step 1).
- Interval – actual damper testing intervals, which will be used to test a damper (Figure 24 – Step 2).

To set up a warm up, the user has to do following steps:

1. Enter target temperature.
2. Enter the desired speed of the warmup.
3. Enter max rebound force (optional).
4. Enter max compression force (optional).
5. Enter max time (optional).
6. Press Add

To set up intervals, the user has to do following steps:

1. Select from dropdown menu (or enter) the time (or cycle count).
2. Select from dropdown menu (or enter) the speed.
3. Enter max rebound force (optional).
4. Enter max compression force (optional).
5. Enter max temperature (optional).
6. Press Add

After desired amount of intervals are added, to start the test, the user has to:

1. Enter test name (Figure 24 – step 3)
2. Enter test comment(Figure 24 – step 4)
3. Press Start

After pressing start, all of the intervals will be executed in the same order as they were added.

ATTENTION: In order to create a successful test, Dyno needs to make 3 rotations to gather enough data to calculate all the graphs. If the time speed and stroke combination would result in a test that is not long enough to make 3 rotations, the software will display a warning and increase the required time automatically.

Interval Presets

To make predefined interval presets, user has to locate “Options” button in the top of the screen, which is located next to “testing” button, then press “interval presets”.

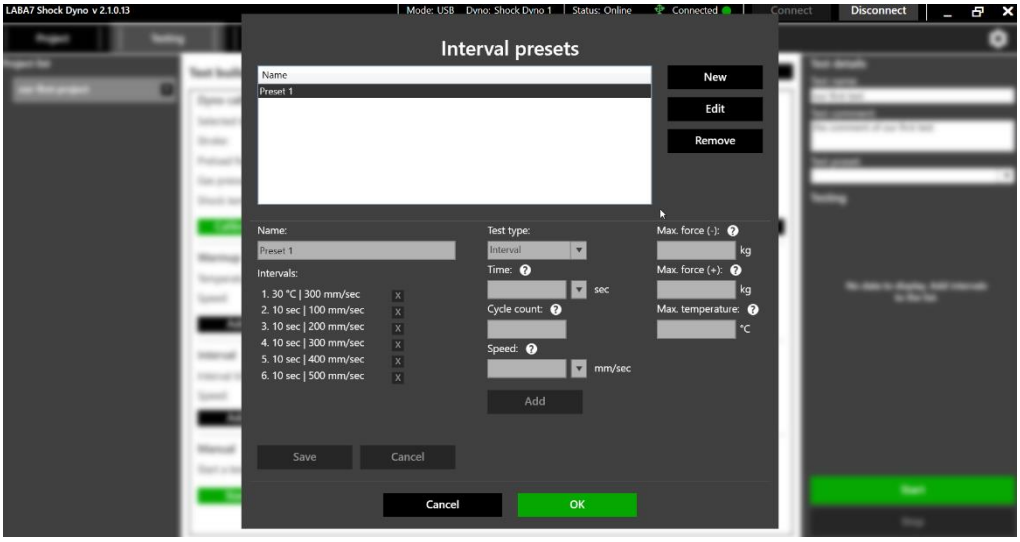


Figure 25

In order to add a new interval preset the user has to complete the following steps:

1. Press New
2. Select the test type, either interval or warmup.
3. Enter time or cycle count.
4. Enter speed.
5. Enter max rebound force (optional).
6. Enter max compression force (optional).
7. Enter max temperature (optional).
8. Press Add

After desired interval count is added, the user has to press Save

9.5. Graph Comparison

In order to compare the graphs of recently done tests, the user has to exit the testing area by pressing Cancel button which is located in top right corner. Then, in projects list, which is located in the left side of the screen, press the drop down arrow on the previously done test and select the runs you wish to compare.

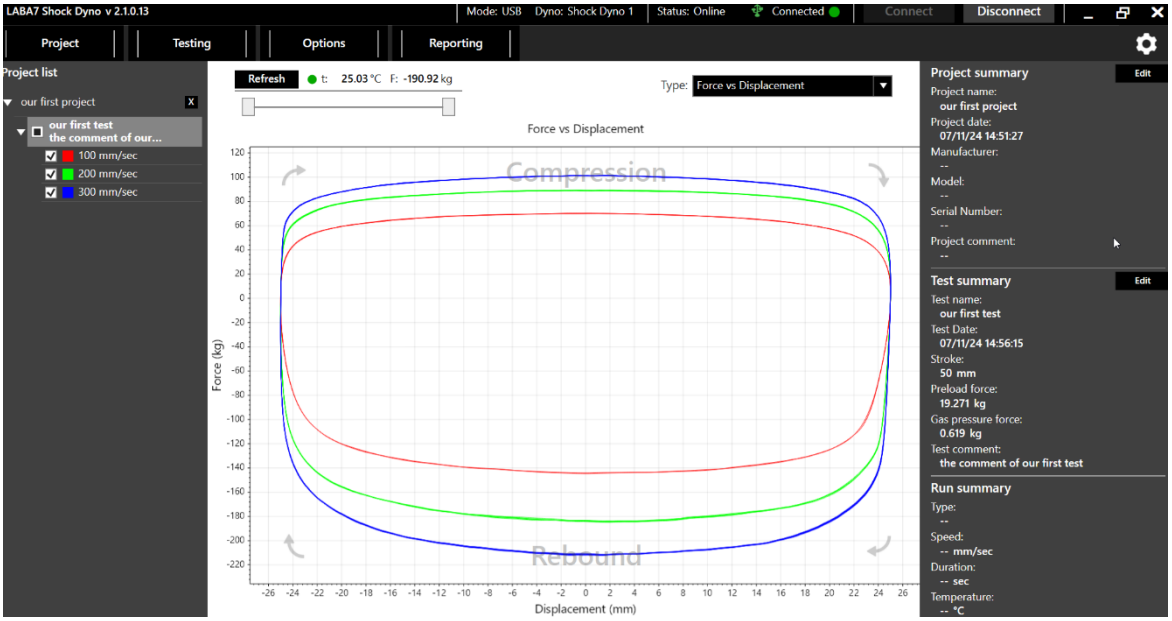


Figure 26

By clicking on the color of the checked test in the Recent Tests list, it is possible to change the color of the graph.

In order to add a visual data point in the graph view, use the left mouse button. There is no limit to the number of data points. Use the right mouse button to clear the data points.

By using the mouse scroll wheel, a user can zoom in or zoom out the displayed graphs. Double-clicking the left mouse button on the graph area will restore the default zoom. It is possible to scroll only on one axis by using the scroll wheel directly over the horizontal or vertical axis label.

9.6. Graph Types

This section describes the different graph types available for each test.

Force vs Displacement

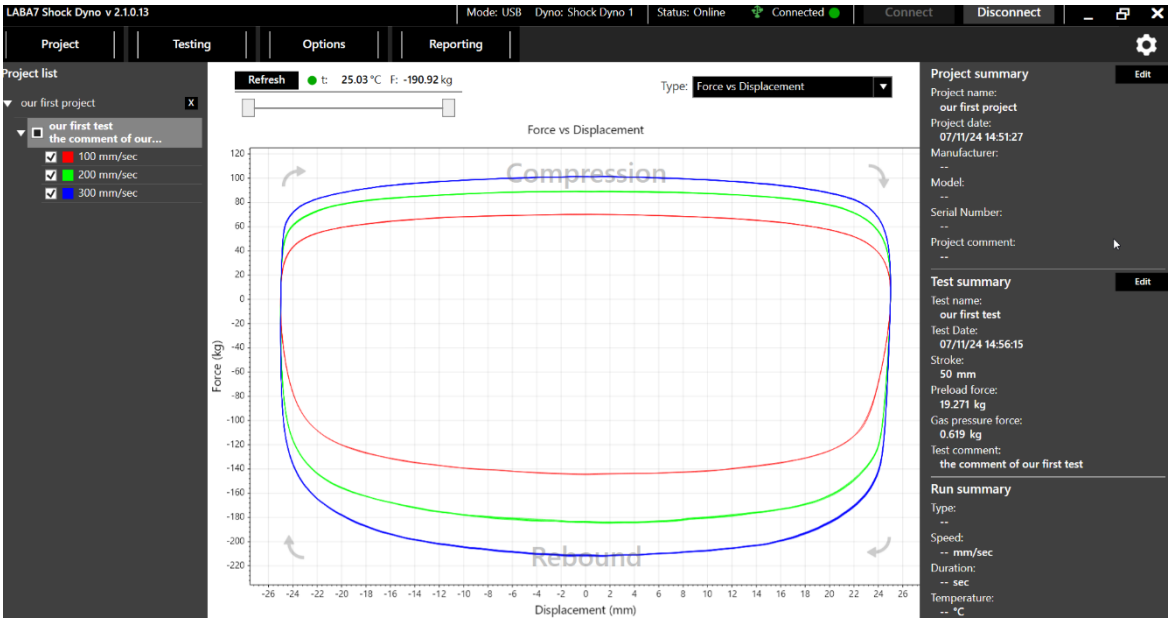


Figure 27

Force vs Displacement is a default graph presented upon launching the application. It is also used for the live test preview whenever a test is being performed.

The horizontal axis represents the displacement. 0 indicates the middle position of the stroke.

The vertical axis represents the force. The positive force in the upper half of the graph represents the compression cycle, and the negative force in the bottom half of the graph represents the rebound cycle.

The left side of the compression and the right side of the rebound represents the speed-up, and the right side of compression and the left side of the rebound represents the slow-down of corresponding cycles.

Avg. Force vs Displacement

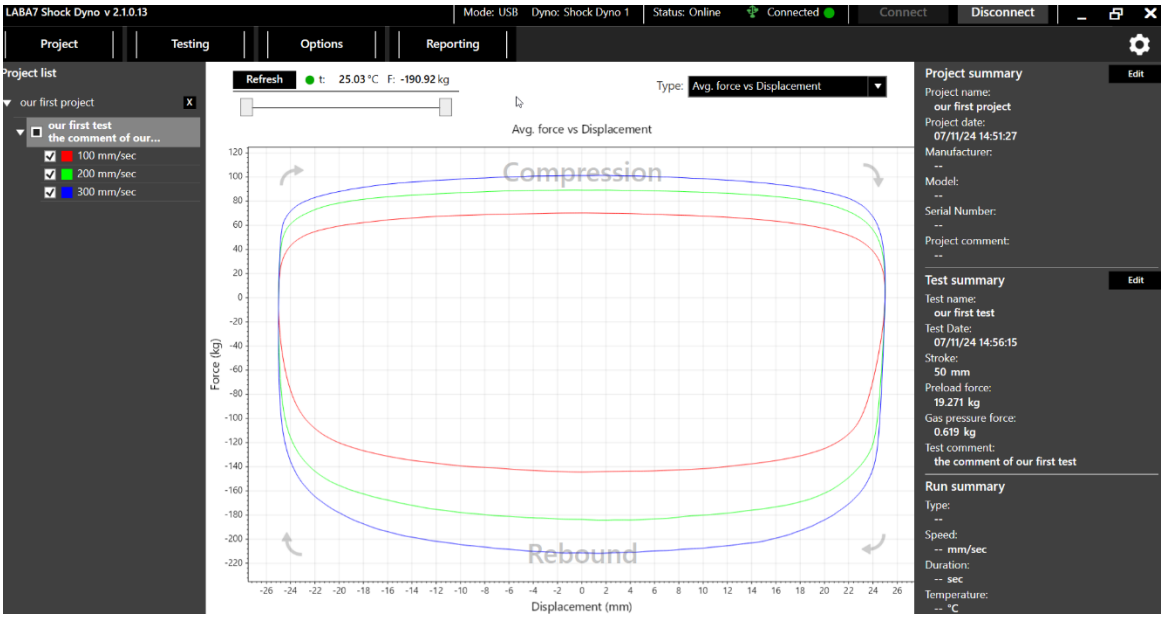


Figure 28

This graph is similar to Force vs Displacement graph; however, it averages the test into a single line, resulting in a graph without the hysteresis.

For details about the axes and compression/rebound cycles, see the section above.

Force vs Velocity

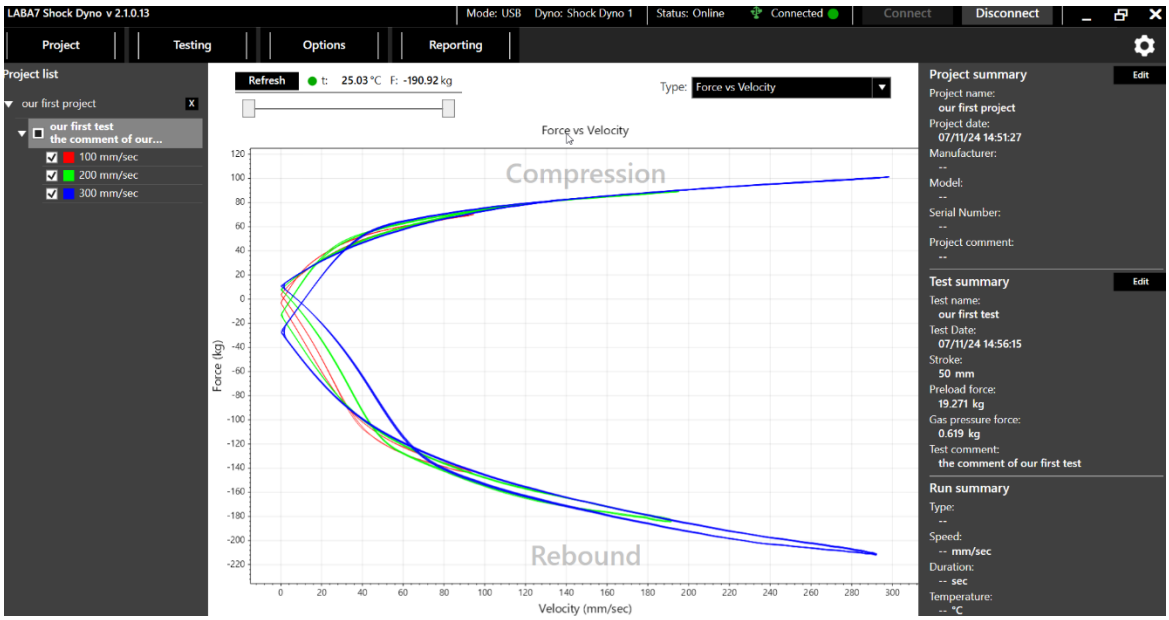


Figure 29

Force vs Velocity graph represents the change in force when the damper is compressed or released at a variable speed.

The horizontal axis indicates the linear speed of the damper, and the vertical axis indicates the resulting force.

The positive force at the top half of the graph represents the compression cycle and the negative force at the bottom half of the graph represents the rebound cycle.

Force vs Avg. Velocity

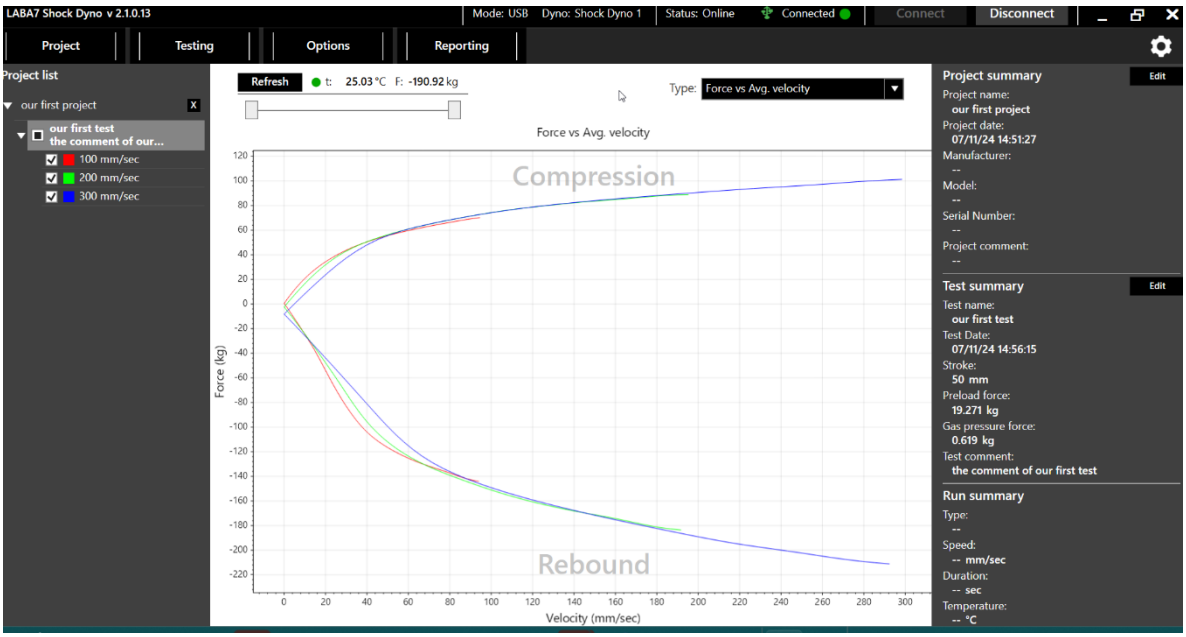


Figure 30

Force vs Avg. Velocity graph represents the average change in force for variable velocity. This graph is similar to Force vs Velocity; however, it shows the graph without the hysteresis. Furthermore, the speed-up and the slow-down of both compression and rebound cycles also averaged into a single line.

Force vs Combined Velocity

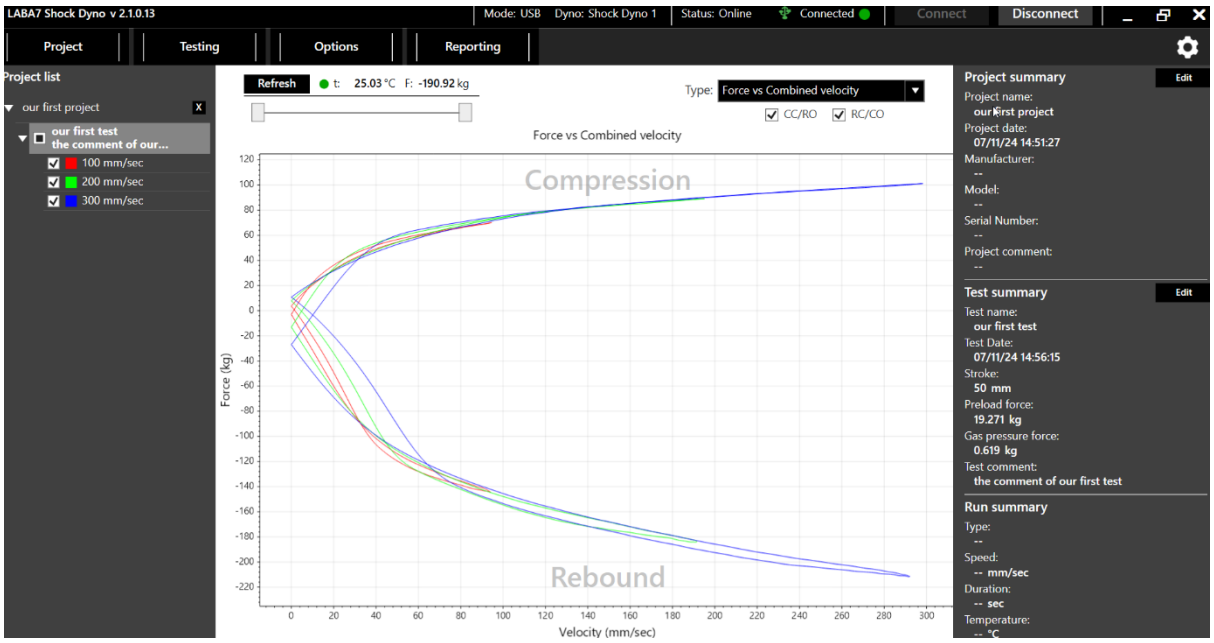


Figure 31

Force vs Combined Velocity graph represents the average change in force for variable velocity. This graph is similar to Force vs Velocity; however, it shows the graph without the hysteresis. The main difference between this graph and Force vs Avg. Velocity is that the speed-up and the slow-down of both compression and rebound cycles are shown as separate lines rather than being collided into a single one.

For details about the axes and compression/rebound cycles, see the section above.

Force vs Peak Velocity

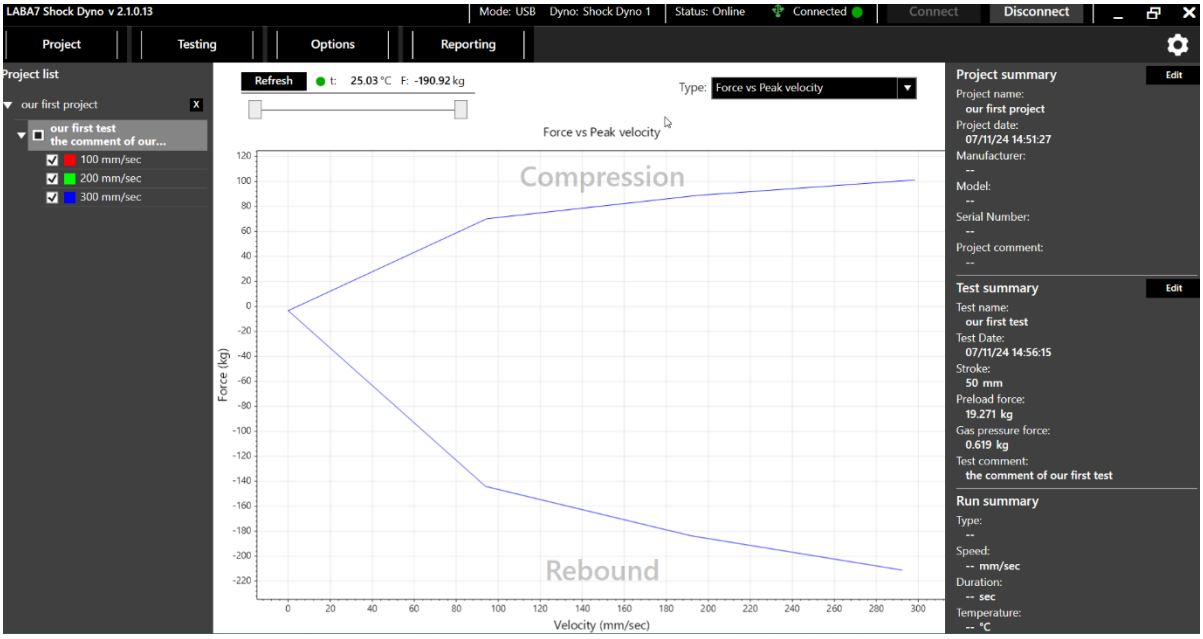


Figure 32

Force vs Peak Velocity graph is available for multiple speed tests.

The horizontal axis indicates the linear speed of the damper, and the vertical axis indicates the resulting force.

The graphs consist of a limited number of data points equal to the number of different speed intervals for both compression and rebound cycles. Each point represents a force at peak velocity for each interval.

Force vs Time

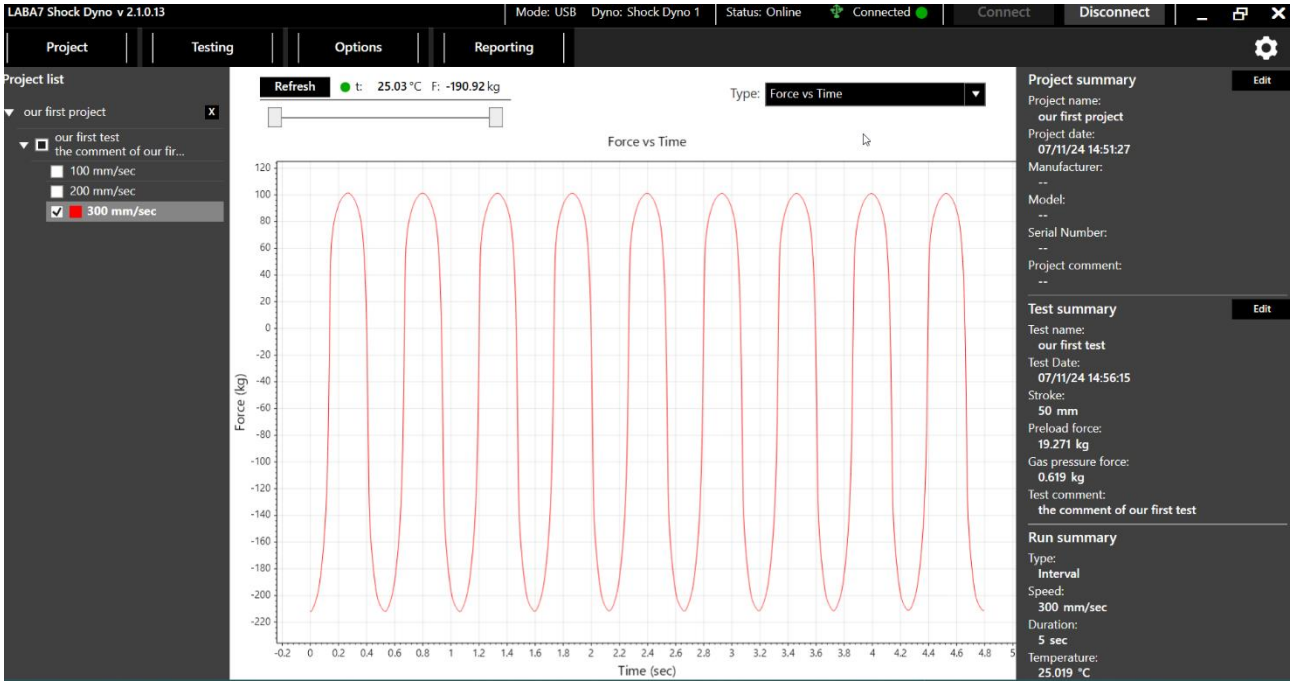


Figure 33

Force vs Time graph represents the force change in time.

The horizontal axis indicates the time, and the vertical axis indicates the change in force.

Such a graph can bring value to the user as it shows the change in the force for each different rotation of the Dyno throughout the whole test and can display details otherwise hidden in the Force vs Displacement graph.

Temperature vs Time

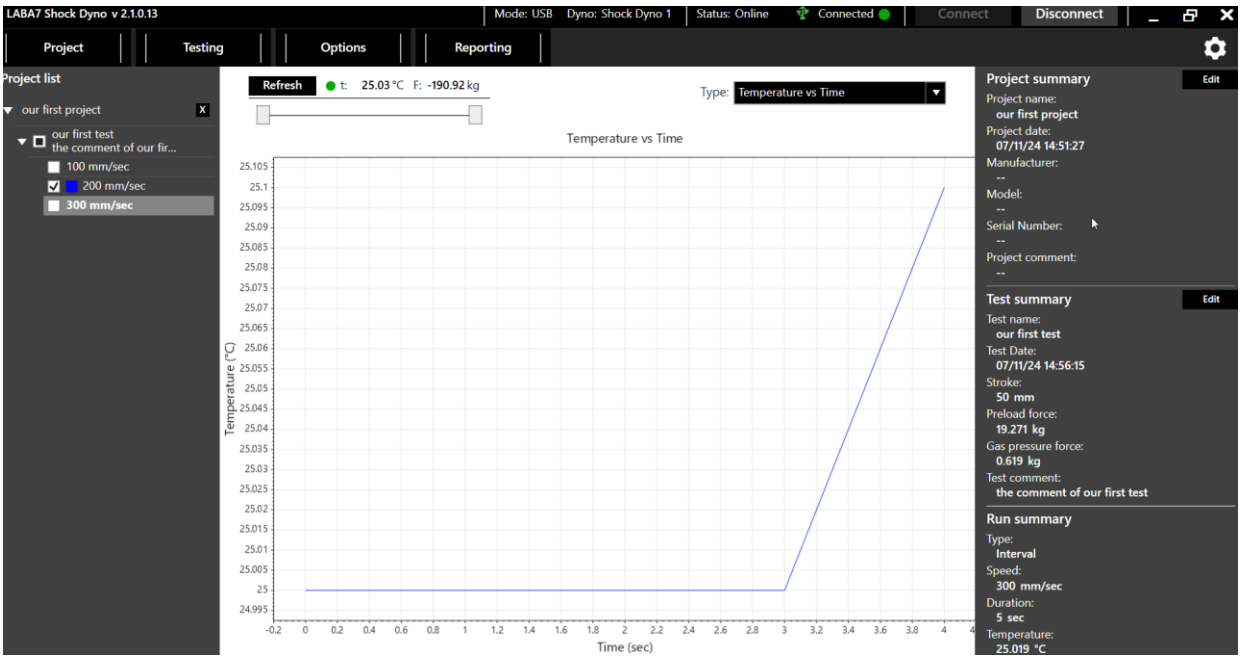


Figure 34

Time vs Temperature graph represents the warmup of the damper. It is not only available for the warmup test but also the interval runs.

The horizontal axis indicates the change in time, and the vertical axis indicates the temperature change.

9.7. Additional Test Options

In options menu, additional graph settings are available. To reach them, user has to press “options, then – hover over graph options and select his desired additional graph option.

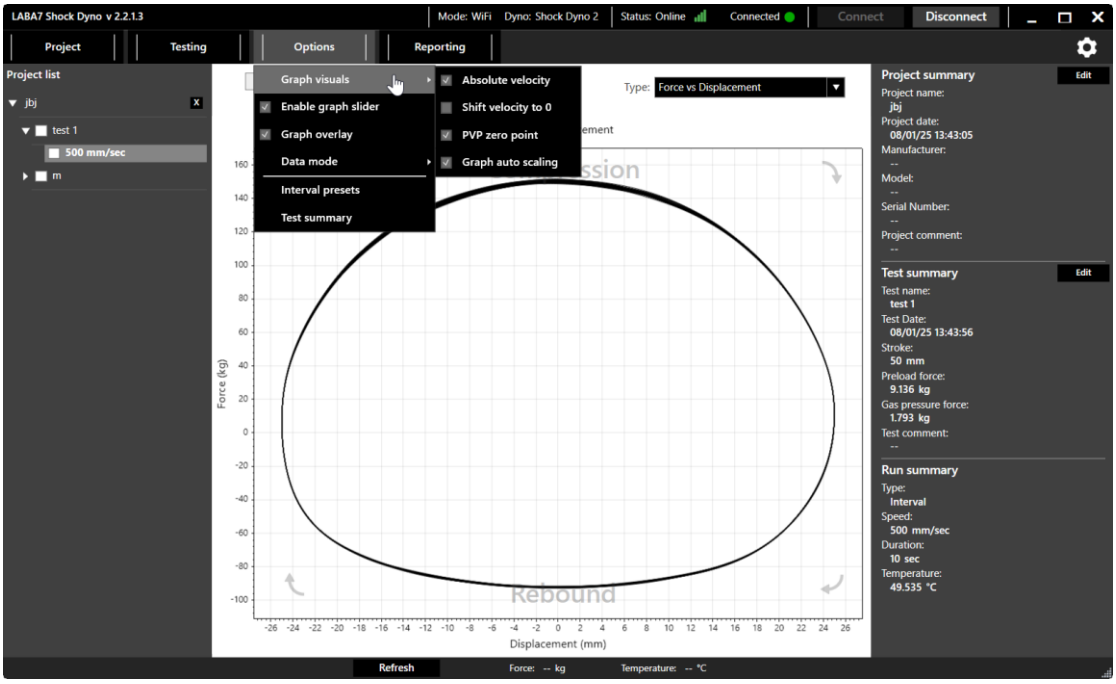


Figure 35

- Shift avg. velocity to 0 – shifts force axis to 0 or leaves it untouched when viewing a Force vs Avg. Velocity graph.
- Absolute velocity – changes how velocity is presented in the graphs, either as a positive or negative speed for a rebound cycle.
- PVP zero point – enables Peak Velocity graph interpolation, which fits the curve with new data points and smoothens the line.
- Graph auto scaling – adjusts the zoom scale to best fit the active graph.
- Enable graph slider – enables the graph slider.
- Graph overlay – shows the cycle naming on the graph.
- Interval presets – opens interval preset menu, where user can edit, and create new presets.
- Test summary - opens the test summary window of the selected test.
- Data mode – user is allowed to switch between EMA and shock dyno data modes.

9.8. Open existing project

In order to open existing project, the user has to locate the “project” button in the top left corner and press “open existing”

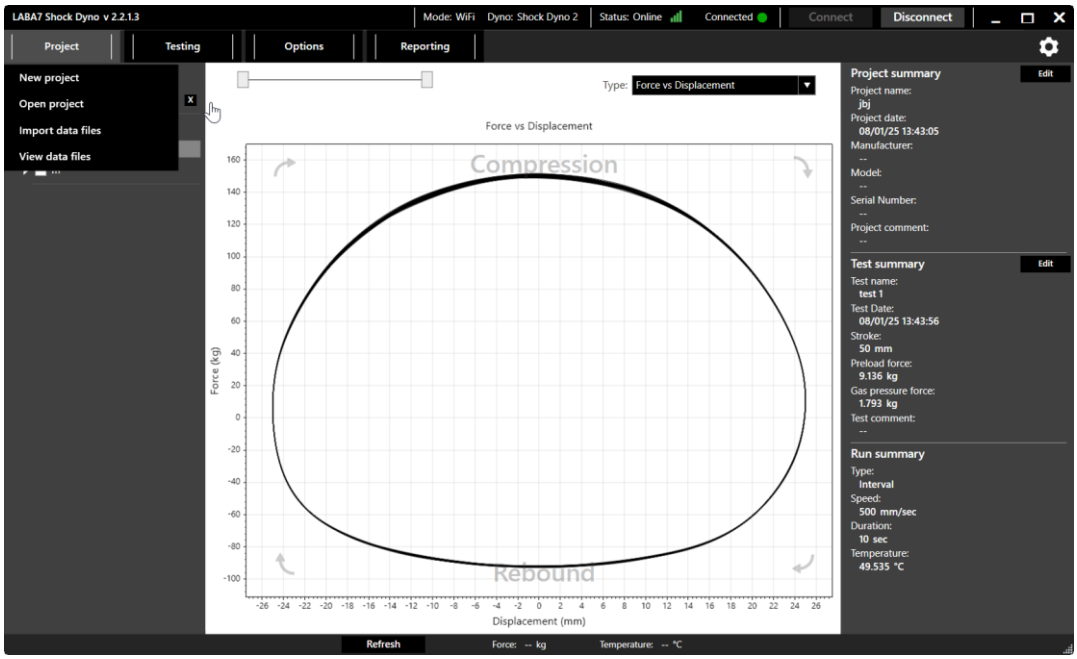


Figure 36

9.9. Test summary

In test summary edit window, user is allowed to eliminate gas pressure force, spring force, also he is allowed to enter data about the device being tested.

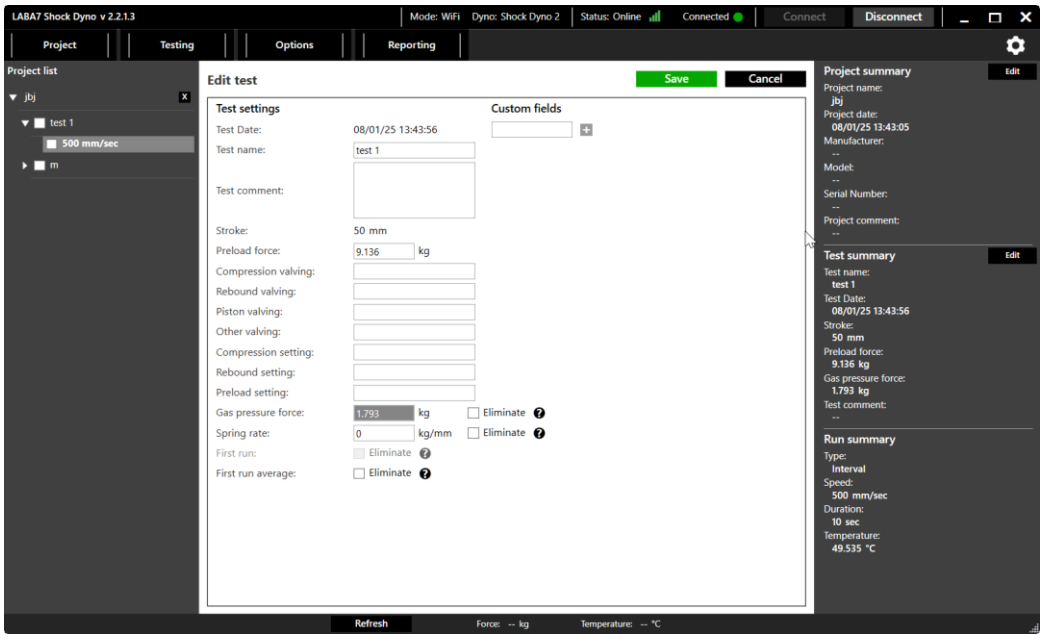


Figure 37

Spring force elimination

To eliminate the force caused by a spring on the damper, the user has to know the spring rate value of the spring. To eliminate the spring force, follow these steps:

1. Locate the test summary window in the right screen of the screen.
2. Press Edit
3. Enter the spring rate.
4. Click on the “eliminate spring rate” checkbox.
5. Press Save

Gas pressure force elimination

The software is capable of eliminating the gas pressure force from the graphs. The gas pressure force is measured during the calibration process. To eliminate gas pressure force, follow these steps:

1. Locate the test summary window in the right side of the screen.

2. Press Edit
3. Click on the gas pressure force elimination checkbox.
4. Press Save

Custom fields

If the user needs to enter more data about the device being tested, he is allowed to make custom data fields. To make them, locate “custom fields” in top right corner of the test summary edit window. Type the needed parameter name and press + . If the user wants for those additional fields to be applied to all upcoming tests, user has to press 💾 .

First run average

This functionality calculates the average force of the first run in the test and eliminates this force for all upcoming runs. In order to do that, user has to press First run average: ☑ Eliminate ?

Keep in mind, that the first run has to be the lowest speed in the whole test. Otherwise, the functionality will work improperly.

9.10. Settings

In the Settings menu, accessible through the main menu, a user can modify the settings related to the general use of the application and custom features related to the graph view.

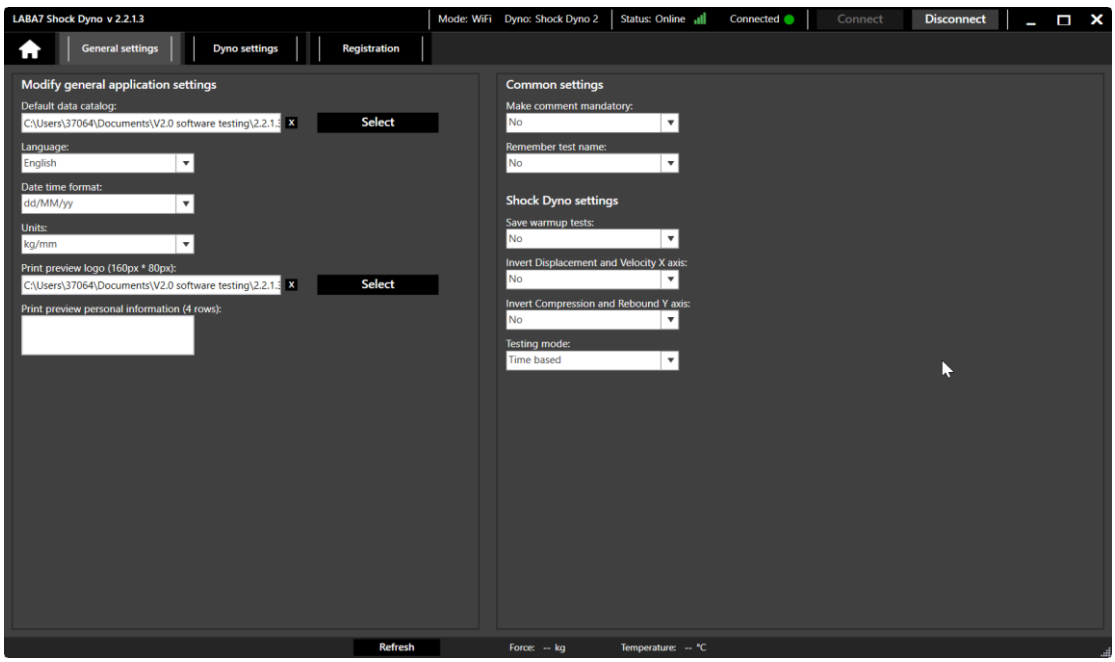


Figure 38

General Settings

- Default Data Catalog – change the default location where the application will store tests.
- Language – change to a different user interface language
- Date time format – change how date and time is presented.
- Units – allows user to change different units of measurement.
- Print Preview Logo – choose an image file that will be visible on a print preview in the upper left corner.
- Print Preview Personal Information – enter any information that is going to be visible on a print preview in the upper right corner.

Other Settings

- make comment mandatory – makes the test comment mandatory.
- save warmup tests – makes the software save the warmup test in project.
- Invert compression and rebound – inverts the compression and rebound Y axis.
- Inverts displacement and velocity X axis.
- Testing mode – select the interval mode, cycle based or time based.

Registration

An area for registering the software. Contact LABA7 support for a license.

9.11. Reporting

The application is capable of printing test reports to .pdf file. To access the functionality, press “reporting” button in the menu. There are 3 different report types, user can select between portrait and landscape print orientations as well.

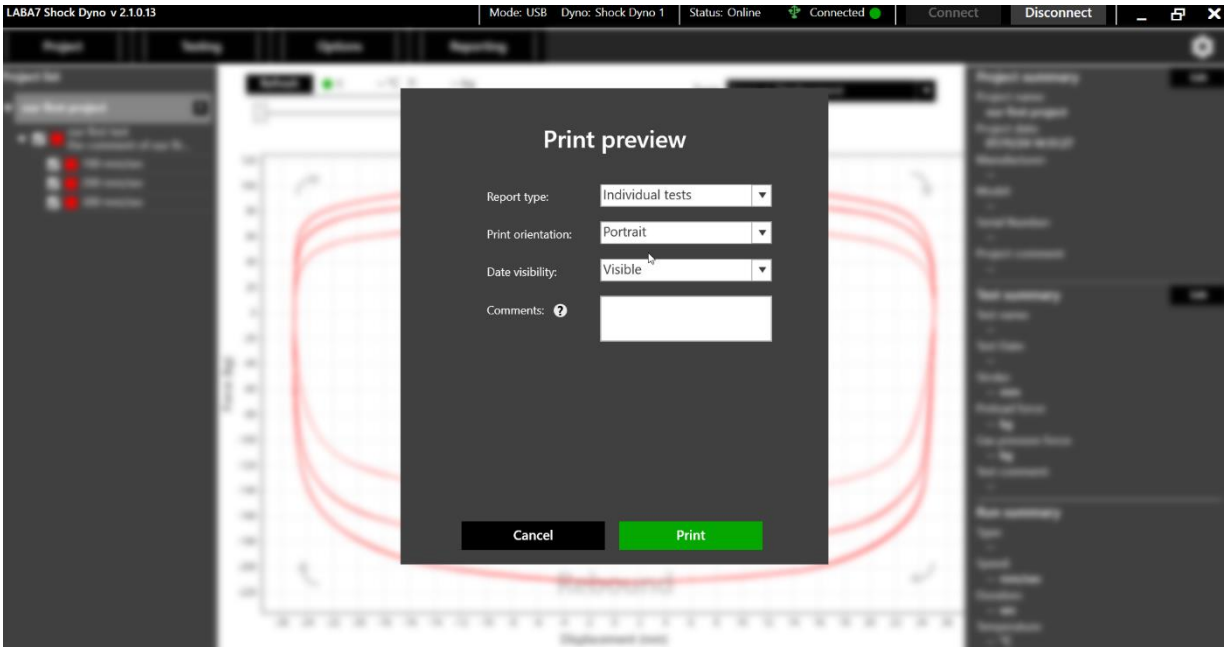


Figure 39

Individual tests report type

Individual test report type includes selected test runs and puts it into separate pages. To print individual test report, follow these steps:

1. Select one or multiple test runs which you want to include into your report, from the project list.
2. Press “reporting”, then – “print”.
3. Select the “individual tests” report type.
4. Select the orientation.
5. Select date visibility.
6. Add some comment if needed
7. Press Print

Comparison report type

Comparison report type includes all of the selected test runs in one graph, making it easy for the user to compare the runs. To print a comparison test report, follow these steps:

1. Select multiple test runs you wish to compare.
2. Press “reporting”, then-“print”.
3. Select comparison report type
4. Select orientation.
5. Select legend visibility.
6. Select date visibility.
7. Enter a comment if needed.
8. Press Print

PVP report type

PVP report type includes force vs displacement, force vs peak velocity graphs and peak velocity intervals table. To print PVP report, follow these steps:

1. Select multiple runs from the test
2. Press “reporting”, then-“print”.
3. Select PVP report type
4. Select orientation.
5. Select date visibility.
6. Enter a comment if needed.
7. Press Print

PVP comparison report type

PVP comparison report type allows to compare 2 or more force vs peak velocity curves in one graph. To print PVP comparison report, follow these steps:

1. Select two or more tests by clicking on the test checkbox to select all of its runs.
2. Press “reporting” then- “print”.
3. Select PVP comparison report type.
4. Select orientation.
5. Select date visibility
6. Select legend visibility.
7. Enter a comment if needed.
8. Press Print.

9.12. Data Export and Import

The software is capable of exporting and importing test data from or to .csv file. There are two options of export: export interval and export PVP. To access this functionality, press “reporting” in the main menu.

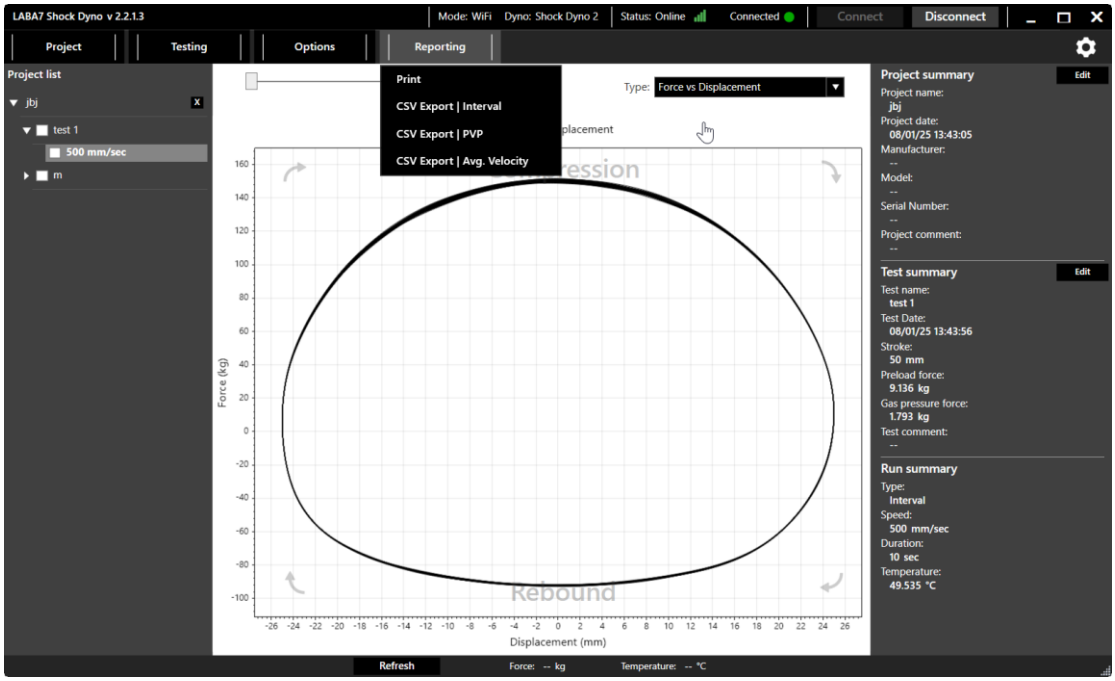


Figure 40

Export interval

To export separate intervals, follow these steps:

1. Select one or more test runs from the project list.
2. Press reporting (fig.40).
3. Select CSV Export | Interval

Export PVP

To export peak velocity plot data, follow these steps:

1. Select multiple runs or whole test.
2. Press “reporting” (fig.40).
3. Select CSV Export | PVP

Export Avg.velocity

To export average velocity graph data, user has to follow these steps:

1. Select runs you want to export.
2. Press “reporting” (fig.39).
3. Select CSV Export | Avg. Velocity

Importing

The software allows user to import .csv files and old data files from older LABA7 versions of the shock dyno software.

To import old data files or .csv files, user has to follow these steps:

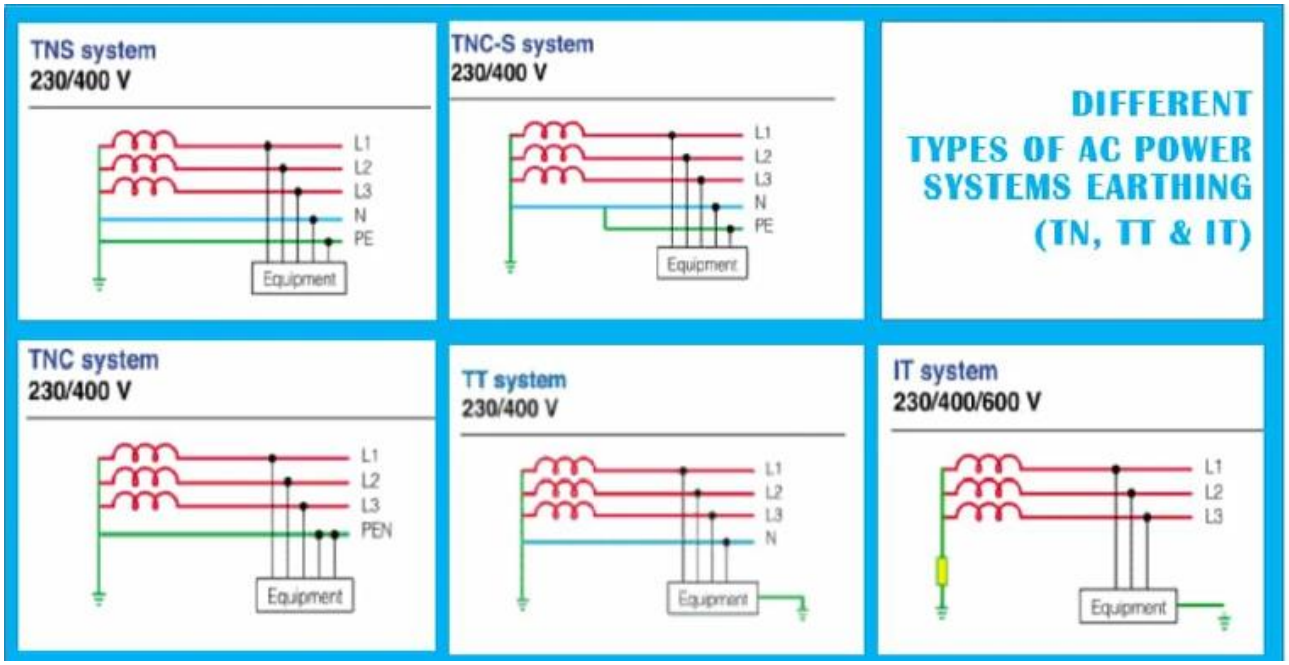
1. Press on “project” in the top left corner.
2. Hower over “import”.
3. Click on Import data files
4. Select the old data files the user wish to import.

Also the software allows user to view old data files, in that case, it is not possible to edit the imported file. To view old data files, user has to follow these steps:

1. Press on “project” in the top left corner.
2. Click on View data files
3. Select the files user wishes to view.

10. Electrical wiring

The LABA7 3 phase shock dynos are wired for TNS 3 phase wiring systems. Check the image bellow to determine which wiring your building has. If the user has different power system in his workshop, he has to reach the LABA7 customer support for instructions.



11. Troubleshooting

This section defines the most common issues that can arise when using the Dyno related to communications, data transfer, application, or mechanical issues and what steps to take in order to fix them.

11.1. General

Issue	Solution
Dyno is not responding, unable to communicate.	Both, Dyno and the application, might be stuck on a loop, or a cache of either one can be full. Restart the Dyno (powering it off and unplugging the USB cable for 1 minute) and restart the application on a computer.
Application is frozen or stuck on a Please Wait dialog and cannot be closed.	Close the application through the Task Manager. If application is stuck on a USB connection, unplug the USB cable to properly shut down the application.
Dyno stops during the test, and when running another test, dyno is not running, only noise is seen on the graph.	During the previous test motor has reached overload, restart the machine.

Cannot communicate with Dyno over USB, Com Port does not appear in the selection.	Reconnect the USB cable (check the sockets on both ends – computer and Dyno). If the issue persists, try a different USB cable, as the latter might be damaged.

11.2. Wi-Fi Configuration

Issue	Solution
Cannot configure Wi-Fi parameters.	The communication mode in Dyno is incorrect. Change the communication mode.
Cannot change communication mode.	The com port number might be incorrect. Select the proper com port number and try again.
Cannot connect to router.	The router might not allow new connections; check the router settings or restart it.
	Check for typos, if caps lock is enabled, re-enter credentials.
Dyno is connected but status appears to be offline.	Computer is not connected to the same network as the Dyno. Reconnect device to the same network or reconfigure the Dyno.

11.3. Wi-Fi Operation

Issue	Solution
Test fails after starting it.	The router cache might be full, resulting in reduced bandwidth. Restart the router.
	Dyno might be receiving a weak signal. Make sure the Dyno is in an open area and the router is in of sight of the Dyno.
Test completes, but the data is missing packets, straight lines are	The signal is unstable, or the router/application cache is full. Restart the application, router, and/or Dyno.

visible across the graph or bad graph data is show.	
Unable to start a test, Dyno appears offline.	The IP address that is assigned to the Dyno by the router might have changed. Connect the USB cable, go to the Settings, select the proper com port and click on the Read Status button. If the Dyno is connected to the router, the application will update the IP address.

11.4. USB Configuration

Issue	Solution
Cannot change communication mode.	The com port number might be incorrect. Select the proper com port number and try again.

11.5. USB Operation

Issue	Solution
Test fails after starting it, lost data packets appear in the graph.	Windows USB driver is busy and cannot receive all the data coming from the Dyno. Close all unwanted programs on the computer, check if Windows updates are not running or an Antivirus is not making a scan, and try again.
Unable to start a test, Dyno appears offline.	The com port number for the Dyno assigned by Windows might have changed. Go to settings and select the proper com port number in the Dyno select on the area.
Test completes, but the data is missing packets, straight lines are visible across the graph or bad graph data is show.	The signal is unstable or the router/application cache is full. Restart the application, router, and/or Dyno.

11.6. Mechanical Failures

Issue	Solution
Dyno will not operate when attempting to start a test.	Make sure the red stop buttons are released prior to starting the test.
Shock keeps shifting/does not hold in place when running compression.	Make sure to insert both horizontal and vertical screws to secure it within the Dyno to hold it in place.
Dyno will not power on/communicate with software	Check if the power grid cable is compatible with the socket.
The device power switch does not light and the device does not start.	Unplug the power cable and change the fuse near the power switch. Fuse parameters: 5×20/10A.

11.7. LED Light Indicator

Light Color	Meaning
Orange	Dyno is starting up after power on, please wait.
White	Configuration is incomplete or the Wi-Fi network is not available. Follow the Software Setup section.
Red	The Emergency Stop button is engaged or the doors are open.
Blue	Dyno is connecting to the wireless network. Please wait.
Yellow	Dyno is ready for the operation.
Green	Operation in progress. Please wait until the operation completes.

ATTENTION: In case the issues persist, contact Laba7 support team for help.

12. Speed to load table

Featherlight Dyno:

Featherlight (60hz, 7.2reduction, 2.2kW)					
Stroke (mm)	**10**	**25**	**50**	**75**	**100**
Max load (kg)	2635	1143	519	380.8	286
Max speed (mm/sec)	131	327	654	982	1309

Featherlight (90hz, 7.2reduction, 2.2kW)					
Stroke (mm)	**10**	**25**	**50**	**75**	**100**
Max load (kg)	2357	941	470	314	235
Max speed (mm/sec)	187	490	982	1472	1963

Featherlight (130hz, 7.2reduction, 2.2kW)					
Stroke (mm)	**10**	**25**	**50**	**75**	**100**
Max load (kg)	775	311	156	103.5	77.5
Max speed (mm/sec)	280	709	1418	2128	2837

Light Dyno:

Light (60hz, 7.8reduction, 2.2kW)							
Stroke (mm)	**10**	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	3993	1601	801	533	399	320	266
Max speed (mm/sec)	121	302	604	906	1208	1450	1812

Light (90hz, 7.8reduction, 2.2kW)							
Stroke (mm)	**10**	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	2670	1068	532	355	266	212	178
Max speed (mm/sec)	181	453	906	1359	1812	2175	2719

Light (130hz, 7.8reduction, 2.2kW)							
Stroke (mm)	**10**	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	1848	738	369	245	184	147	122
Max speed (mm/sec)	262	654	1309	1963	2618	3150	3927

MID Dyno:

MID (60hz, 7.8reduction, 3.7kW)						
Stroke (mm)	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	2574	1285	856	643	515	428
Max speed (mm/sec)	302	604	906	1208	1450	1812

MID (90hz, 7.8reduction, 3.7kW)						
Stroke (mm)	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	1714	858	569	428	342	285
Max speed (mm/sec)	452	905	1358	1811	2175	2717

MID (130hz, 7.8reduction, 3.7kW)						
Stroke (mm)	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	1184	592	394	296	237	197
Max speed (mm/sec)	654	1309	1963	2618	3150	3927

Heavy Dyno:

HEAVY (60hz, 7.8reduction, 7.5kW)						
Stroke (mm)	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	4400	2250	1500	1120	894	743
Max speed (mm/sec)	337	673	1010	1346	1615	2020

HEAVY (90hz, 7.8reduction, 7.5kW)						
Stroke (mm)	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	3000	1485	991	743	594	496
Max speed (mm/sec)	505	1010	1515	2020	2420	3029

HEAVY (130hz, 7.8reduction, 7.5kW)						
Stroke (mm)	**25**	**50**	**75**	**100**	**120**	**150**
Max load (kg)	2055	1027	686	514	411	343
Max speed (mm/sec)	729	1459	2188	2917	3500	4367

13. Warranty Information

LABA7 Shock Dyno is covered for 1 year of manufacturer warranty starting from the date of purchase, and it covers any manufacturer-related failures during that period.

WHAT IS NOT COVERED

ALTERATION, MISUSE, OR ACCIDENT DAMAGE

Examples are:

- Failure to operate the device in accordance with the Owner's manual.
- Collision, fire, theft, freezing, vandalism, riot, explosion, or objects striking your device.
- Alteration of your device, including software programming or other components.
- Damage caused by improper maintenance or failure to follow the recommended maintenance schedule.

The repair of damages that are caused because parts or services used were not those prescribed in this manual's recommended maintenance schedule is not covered under warranty. It is the owner's responsibility to maintain the device as more fully set forth in and in accordance with the maintenance schedules outlined in this manual.

MODIFICATIONS

Damage or performance problems resulting from modifications to your device are not covered under warranty.

Examples of modifications:

- Altering any mechanical parts or software programming.

The manufacturer is not responsible for any damages to the device during transportation. During accepting the shipment, please inspect the package for any visual damage. If the package is damaged, do not accept it.

14. Contact

If you have further questions about the product or need help with the installation, our technical staff will be happy to help you. Contact information can be found on our website www.laba7.com.

- UAB LABA7

- Giluzio st. 15
  Vilnius
  LT-08412
  Lithuania

- info@laba7.com
- +37062199469

EU Declaration of Conformity

Date of Issue 2nd September 2021 Vilnius, Declaration Number 2021-09-02/01

Name of the manufacturer:	LTD “LABA7”
Address of the manufacturer:	Gilužio str. 15, LT-06239, Vilnius, Lithuania
Contacts of the manufacturer:	info@laba7.com
Object of the declaration:	Featherlight Shock Dyno
Identification code of the object:	LBA2-00040
Description of the object:	Featherlight Shock Dyno is the entry level shock dynamometer, which is based on scotch-yoke mechanism. This compact machine is oriented towards the MTB market and those who want to start their dyno work at a very affordable price. Main specifications: velocity: up to 1 900 mm/s; maximum force: 10 000 N load cell; adjustable stroke: 25-50-75-100 mm; motor: 3 HP-220V electric motor; weight: 170 kg.
Object of the declaration described above is in conformity with the relevant Union harmonisation legislation:	– Machinery (MD) Directive 2006/42/EC – Electromagnetic Compatibility (EMC) Directive 2014/30/EU – Low voltage (LVD) Directive 2014/35/EU – Radio Equipment (RED) Directive (2014/53/EU)
References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:	– EN IEC 61000-6-1:2019 – EN IEC 61000-6-2:2019 – EN IEC 61000-6-3:2021 – EN IEC 61000-6-4:2020 – EN IEC 61000-3-2:2019 – EN IEC 61000-3-3:2013 – ETSI EN 301 489-1:2019 – ETSI EN 301 489-17:2020 – IEC 60335-1:2020
Additional information:	This declaration certifies compliance with the above-mentioned directives. This declaration of conformity is issued under the sole responsibility of the manufacturer. The technical documentation for the object of declaration is available from the manufacturer at the address above.
Name and title of the manufacturers' representative:	Andrius Liškus CEO
Signature of the manufacturers' representative:	

EU Declaration of Conformity

Date of Issue 8th July 2020 Vilnius, Declaration Number 2020-07-08/01

Name of the manufacturer:	LTD “LABA7”
Address of the manufacturer:	Gilužio str. 15, LT-06239, Vilnius, Lithuania
Contacts of the manufacturer:	info@laba7.com
Object of the declaration:	Heavy Shock Dyno
Identification code of the object:	LBA2-00027
Description of the object:	Heavy shock dyno is the most powerful version of LABA7 shock dynamometers. It can service any shock and fork but is best suited for off-road cars, 4X4s, trucks, or advanced motocross suspension work. Main specifications: velocity: up to 3 000 mm/s; maximum force: 15 000 N load cell; adjustable stroke: 25-50-75-100-120-150 mm; motor: 10 HP-380V electric motor; weight: 550 kg.
Object of the declaration described above is in conformity with the relevant Union harmonisation legislation:	– Machinery (MD) Directive 2006/42/EC – Electromagnetic Compatibility (EMC) Directive 2014/30/EU – Low voltage (LVD) Directive 2014/35/EU – Radio Equipment (RED) Directive (2014/53/EU)
References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:	– EN IEC 61000-6-1:2019 – EN IEC 61000-6-2:2019 – EN IEC 61000-6-3:2021 – EN IEC 61000-6-4:2020 – EN IEC 61000-3-2:2019 – EN IEC 61000-3-3:2013 – ETSI EN 301 489-1:2019 – ETSI EN 301 489-17:2020 – IEC 60335-1:2020
Additional information:	This declaration certifies compliance with the above-mentioned directives. This declaration of conformity is issued under the sole responsibility of the manufacturer. The technical documentation for the object of declaration is available from the manufacturer at the address above.
Name and title of the manufacturers' representative:	Andrius Liškus CEO
Signature of the manufacturers' representative:	

EU Declaration of Conformity

Date of Issue 6th October 2020 Vilnius, Declaration Number 2020-10-06/01

Name of the manufacturer:	LTD “LABA7”
Address of the manufacturer:	Gilužio str. 15, LT-06239, Vilnius, Lithuania
Contacts of the manufacturer:	info@laba7.com
Object of the declaration:	Light Shock Dyno
Identification code of the object:	LBA2-00034
Description of the object:	Light Shock Dyno is a device for building, rebuilding, or tuning shocks and forks. It is perfect for testing MTB, road motorcycles, and road car suspensions. Main specifications: velocity: up to 2 500 mm/s; maximum force: 10 000 N load cell; adjustable stroke: 25-50-75-100-120-150 mm; motor: 4 HP-220V electric motor; weight: 300 kg.
Object of the declaration described above is in conformity with the relevant Union harmonisation legislation:	– Machinery (MD) Directive 2006/42/EC – Electromagnetic Compatibility (EMC) Directive 2014/30/EU – Low voltage (LVD) Directive 2014/35/EU – Radio Equipment (RED) Directive (2014/53/EU)
References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:	– EN IEC 61000-6-1:2019 – EN IEC 61000-6-2:2019 – EN IEC 61000-6-3:2021 – EN IEC 61000-6-4:2020 – EN IEC 61000-3-2:2019 – EN IEC 61000-3-3:2013 – ETSI EN 301 489-1:2019 – ETSI EN 301 489-17:2020 – IEC 60335-1:2020
Additional information:	This declaration certifies compliance with the above-mentioned directives. This declaration of conformity is issued under the sole responsibility of the manufacturer. The technical documentation for the object of declaration is available from the manufacturer at the address above.
Name and title of the manufacturers' representative:	Andrius Liškus CEO
Signature of the manufacturers' representative:	

LIETUVOS RESPUBLIKA UAB LABA7 LTD REPUBLIC OF LITHUANIA

EU Declaration of Conformity

Date of Issue 4th December 2019 Vilnius, Declaration Number 2019-12-04/01

Name of the manufacturer:	LTD “LABA7”
Address of the manufacturer:	Gilužio str. 15, LT-06239, Vilnius, Lithuania
Contacts of the manufacturer:	info@laba7.com
Object of the declaration:	Mid Shock Dyno
Identification code of the object:	LBA2-00011
Description of the object:	Mid Shock Dyno provides the best price-to-performance ratio. It is perfect for dirt track, motocross, and track car suspension servicing and tuning. Main specifications: velocity: up to 2 500 mm/s; maximum force: 15 000 N load cell; adjustable stroke: 25-50-75-100-120-150 mm; motor: 5.5 HP-380V electric motor; weight: 500 kg.
Object of the declaration described above is in conformity with the relevant Union harmonisation legislation:	– Machinery (MD) Directive 2006/42/EC – Electromagnetic Compatibility (EMC) Directive 2014/30/EU – Low voltage (LVD) Directive 2014/35/EU – Radio Equipment (RED) Directive (2014/53/EU)
References to the relevant harmonized standards used or references to the other technical specifications in relation to which conformity is declared:	– EN IEC 61000-6-1:2019 – EN IEC 61000-6-2:2019 – EN IEC 61000-6-3:2021 – EN IEC 61000-6-4:2020 – EN IEC 61000-3-2:2019 – EN IEC 61000-3-3:2013 – ETSI EN 301 489-1:2019 – ETSI EN 301 489-17:2020 – IEC 60335-1:2020
Additional information:	This declaration certifies compliance with the above-mentioned directives. This declaration of conformity is issued under the sole responsibility of the manufacturer. The technical documentation for the object of declaration is available from the manufacturer at the address above.
Name and title of the manufacturers' representative:	Andrius Liškus CEO
Signature of the manufacturers' representative:	

LIETUVOS RESPUBLIKA UAB LABA7 LTD REPUBLIC OF LITHUANIA