LABA7 Electromagnetic Shock Dyno EMA
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 EMA (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 EMA 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 EMA 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 EMA!

- Our fully automatic electromagnetic 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/Seal drag force/Spring rate.
- High-accuracy force/pressure sensors.

4. Technical Specifications

Below are the specifications of each individual electromagnetic Shock Dyno model:

EMA 30KW:

- peak force: 11.9kN@2m/s.
- Stroke: 0-250mm.
- Maximum velocity: 7m/s.
- Maximum acceleration 40G.
- Power requirements: 1 phase 220VAC or 240VAC.

EMA 60KW:

- Peak force: 22kN@2m/s.
- Stroke: 0-250mm.
- Maximum velocity: 7m/s.
- Maximum acceleration 40G.
- Power requirements: 3 phase 380 VAC / 400 VAC - from 16 A.

EMA 90KW:

- Peak force: 31.5kN@2m/s.
- Stroke: 0-250mm.
- Maximum velocity: 7m/s.
- Maximum acceleration 40G.
- power requirements: 3 phase 380 VAC / 400 VAC - from 16 A.

EMA 120KW:

- Peak force: 45.4kN @ 2 m/s.
- Stroke: 0-250mm.
- Maximum velocity: 7m/s.
- Maximum acceleration 40G.
- power requirements: 3 phase 380 VAC / 400 VAC - from 16 A.

5. Know Your Shock Dyno EMA

5.1. Overview

The overview of the LABA7 Shock dyno EMA is presented in the image below:

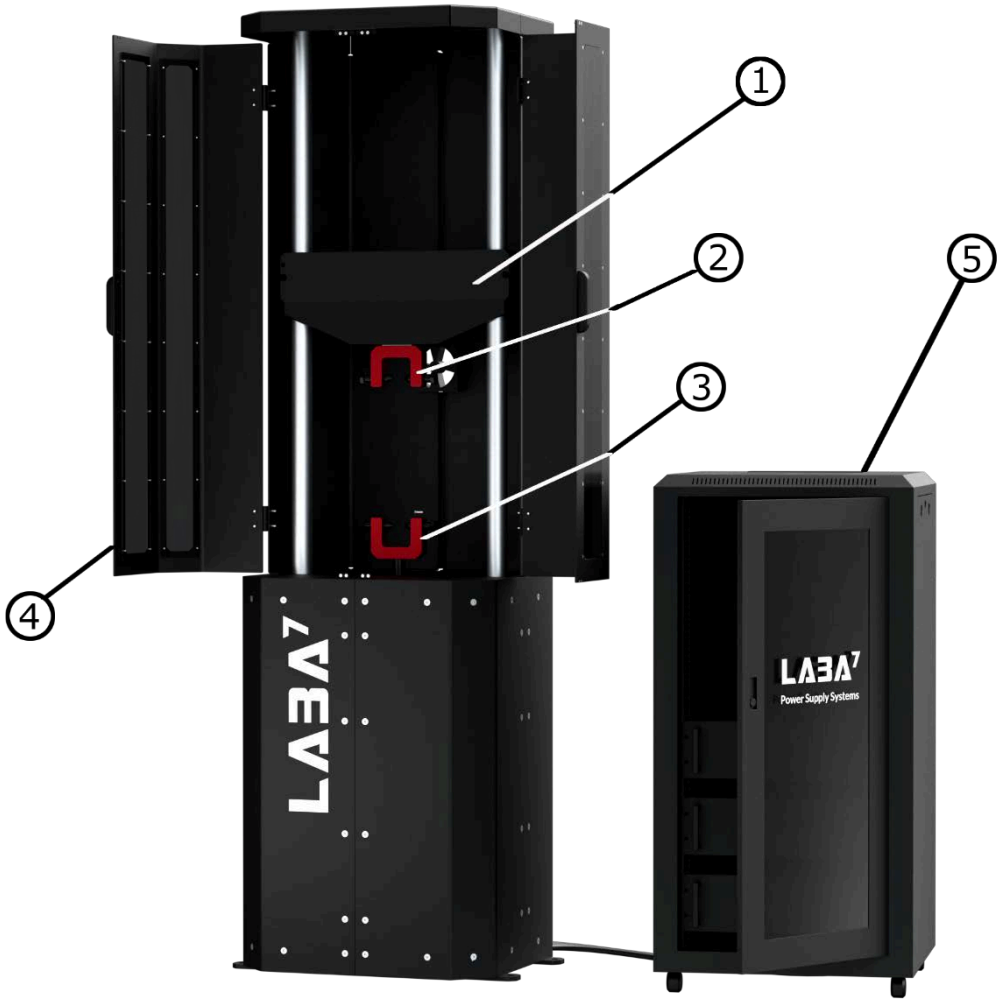

Figure 2

1. Crossbar.
2. Top mounting.
3. Bottom mounting
4. Safety lid.
5. LABA7 smart power supply.

5.2. LABA7 smart power supply overview

The overview of LABA7 smart power supply is presented below:

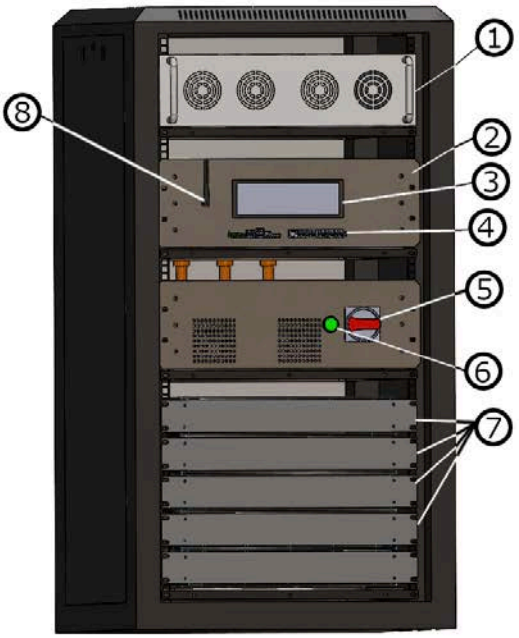

Figure 3

1. Power supply.
2. Control unit.
3. Screen.
4. Wire connectors.
5. Power switch.
6. Power indicator.
7. Super capacitor module.
8. Wi-Fi antenna.

5.3. 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.

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 electromagnetic Shock Dyno EMA.

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 4

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 5

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 6

MTB Fork Assembly

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

Figure 7

MTB Cartridge Assembly

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

Figure 8

Trunnion Assembly

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

Figure 9

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 electromagnetic Shock Dyno EMA 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 10 – 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.

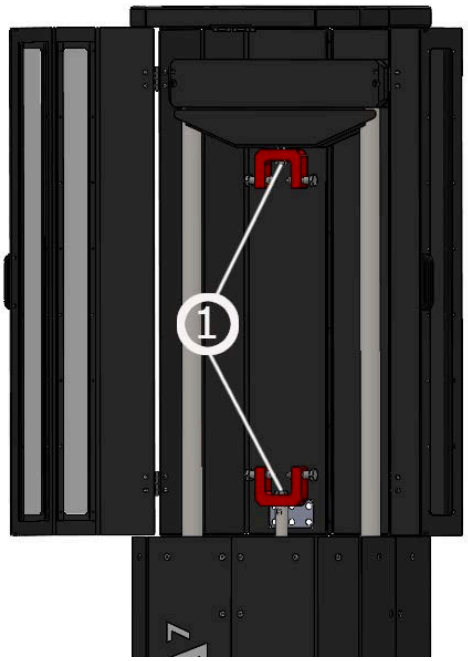

Figure 10

7. First Launch

This section provides information associated with the first use of the LABA7 Shock Dyno EMA.
Follow the steps below to launch the Shock Dyno EMA for the first time:

1. Connect the motor to the LABA7 smart power supply. Open the back door of the power supply, motor connectors are marked V U and W. Same markings are located on the motor itself. The user has to connect the wires according to the marking.
2. Open the front door of the power supply. Connect the motor temperature sensor. The temperature sensor connector is marked “temperature” on the motor. It has to be connected to “temp” connector on the power supply.
3. Connect motor’s encoder to the power supply. On the motor, the encoder’s connector is marked “encoder”. It has to be connected to “enc” connector of the power supply.
4. Connect the load cell. The load cell is located at the top of the motor and it has to be connected to “frc” connector on the power supply.
5. Connect the air supply to the motor’s air supply port.
6. Connect the emergency button to “EM” connector of the power supply.
7. Open the safety doors by pulling from the cover side handle.
8. Place the damper within the top or bottom adapter and secure it.
9. Power on the Shock Dyno by turning the power switch (Fig. – 3) clock-wise, which is behind the front door of the power supply, to configure the software.

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).

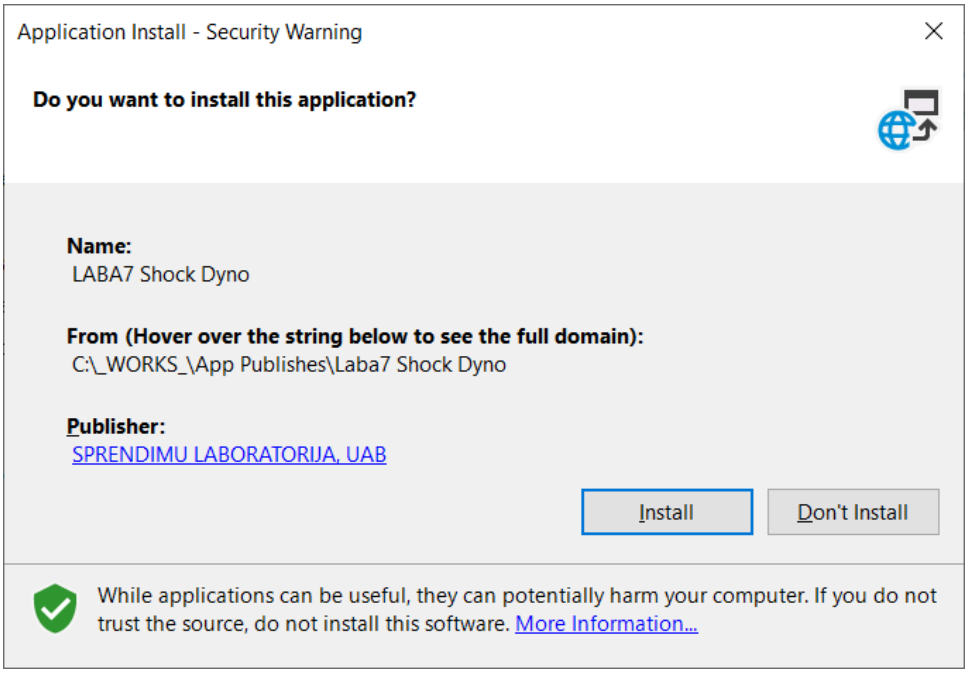

Figure 11

8.3. Configuration and setting up LAN-cable communication

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

1. Launch the application and go to the Settings page which is located in the top right corner.

Figure 12

2. Select the default data catalog, this is the catalog, where all of your test project files will be saved.(Figure 13 – Step 1).

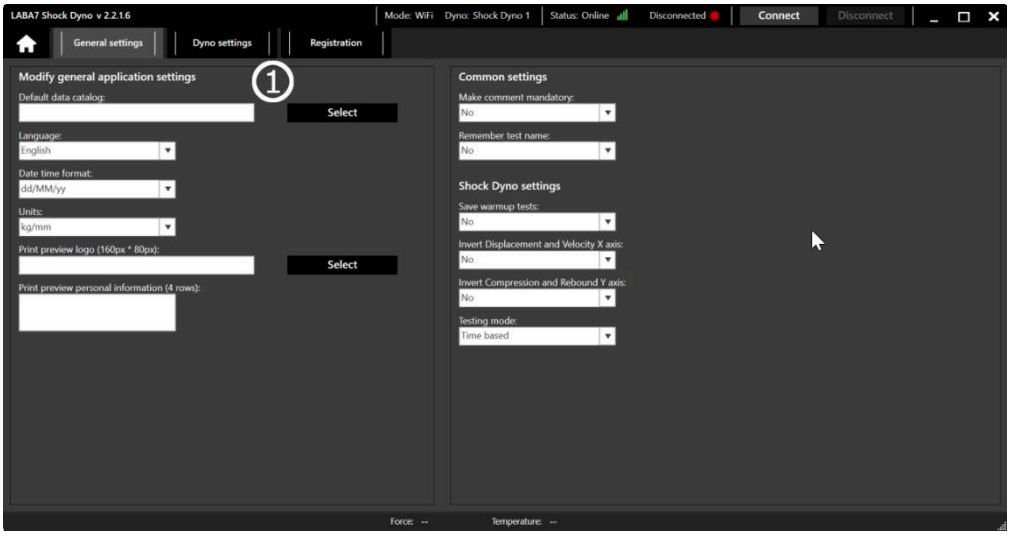

Figure 13

3. Go to the Dyno Settings tab.
4. Add a new Dyno model by clicking Add button (Figure 14 – 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.

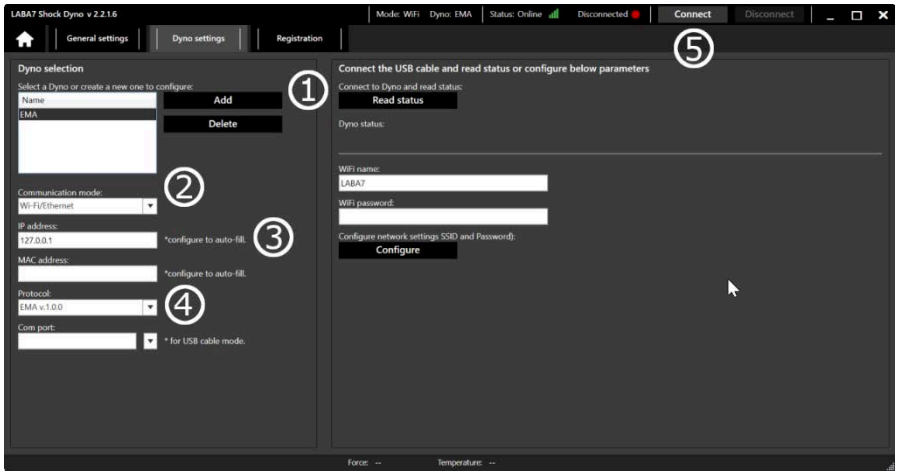

Figure 14

5. Connect the dyno to computer with LAN cable. Lan cable should be connected to "ETH" port of the LABA7 smart power supply.
6. Turn on the Dyno if it was previously turned off by turning the power switch, wait till it boots up. LAN IP adress showing up on the screen indicates that the device is ready.
7. Select Wi-Fi/Ethernet communication mode. (Figure 14 – Step 2)
8. Enter the IP adress of the device. The IP adress is shown on the screen of the power supply. (Figure 14 – Step 3)
9. Select protocol: EMA v.1.0.0 (Figure 14 – Step 4).
10. Press Connect (Figure 14 – Step 5). status indicates, that the connection is successful.

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

- To setup wireless communication, the device has to be already connected via LAN cable, check paragraph 8.3 on how to do that.

Follow the steps below to configure the wireless communication:

1. Make sure the dyno is connected to the computer with LAN cable and the communication is active. Status in the top indicates, that the connection is active.
2. Go to the Dyno Settings tab.
3. Enter Wi-Fi name (Figure 15 – Step 1).
4. Enter Wi-Fi password (Figure 15 – Step 2).
5. Click on Configure button (Figure 15 – Step 3).
6. Once you get notification about successful Wi-Fi connection, press **Disconnect** (Figure 15 – Step 4).
7. Disconnect the LAN cable from the PC and wait, till the device will start showing wLAN IP adress on the screen.
8. Change the IP adress to the one which is now being showed in the screen of the device. (Figure 15 – Step 5).
9. Press **Connect** (Figure 15 – Step 6).

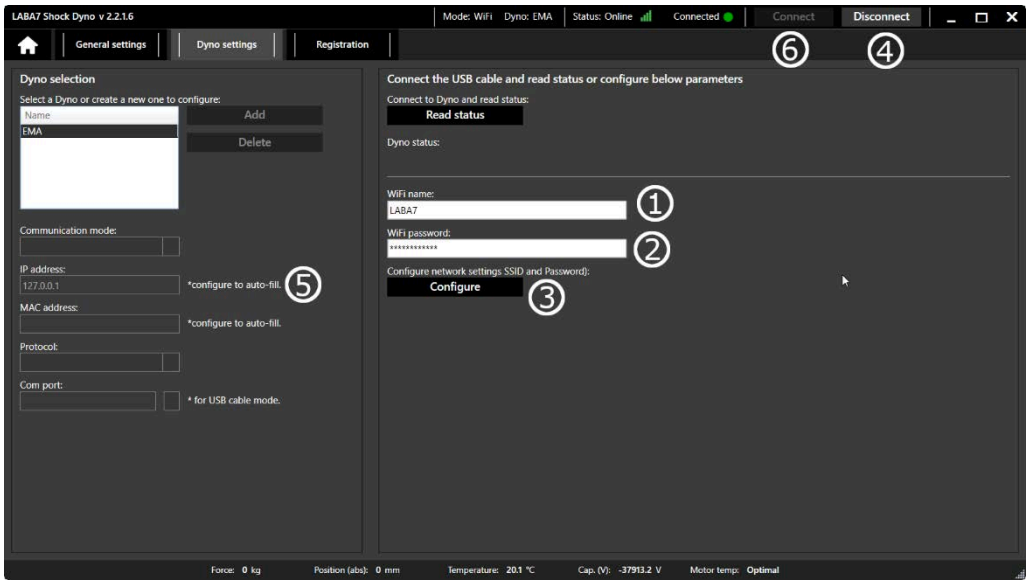

Figure 15

After a successful connection to the router, Dyno status should be **Connected** ●

<u>ATTENTION</u>: 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 and other additional functionalities.
- Reporting – for report printing and data exporting.
- Settings – software and hardware configuration.

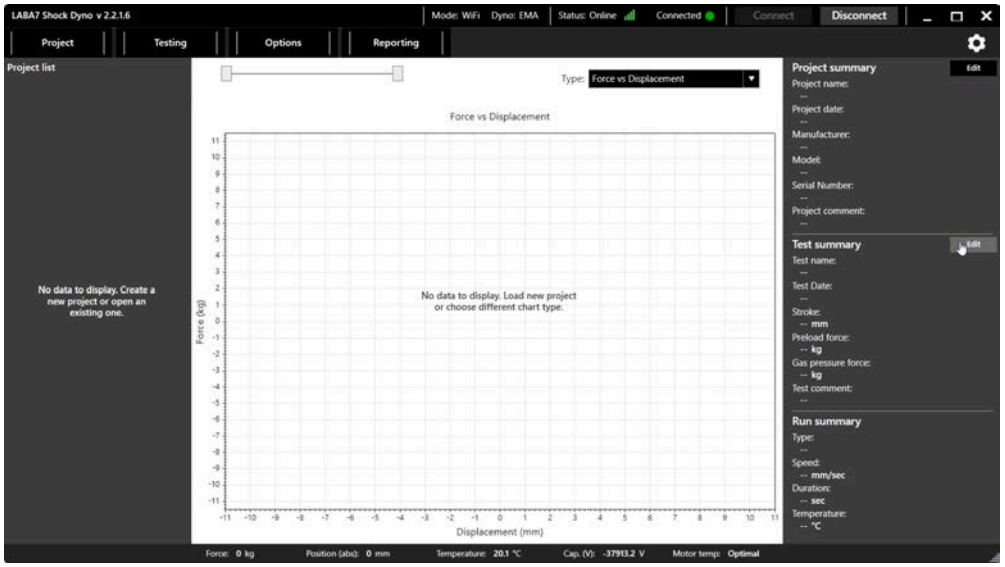

Figure 16

Additionally, you can check your software version, edit project summary, edit test summary. You can see which dyno is active and what communication method is being used as well. Also, in the bottom, user is provided with live data information of force, position, damper temperature, capacitor module voltage and the motor temperature. If the motor temperature is not optimal, the machine won't allow you to do tests.

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.

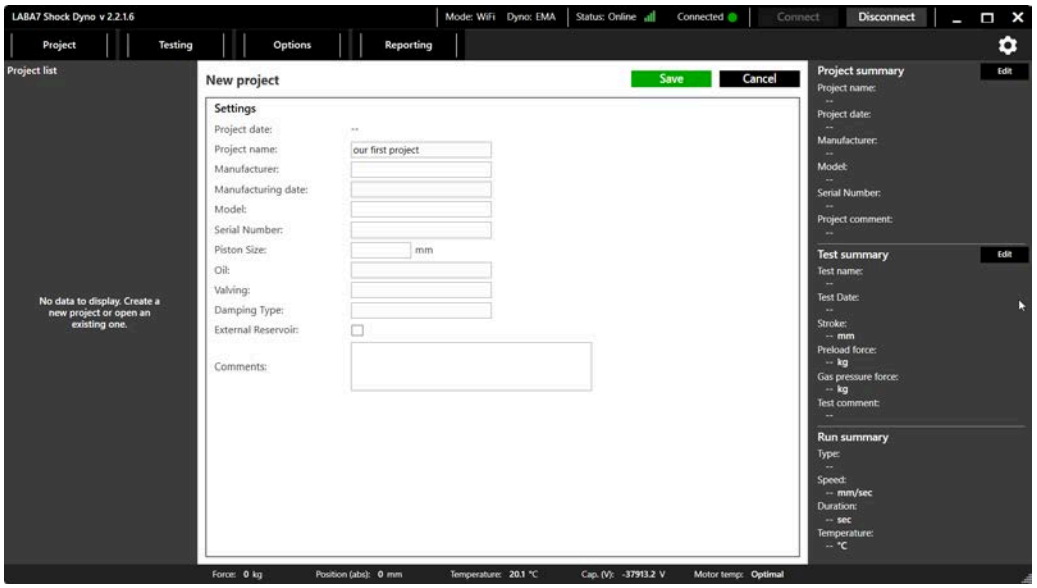

Figure 17

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. Testing

This section describes the EMA testing window.

In this window user can see the parameters of the EMA, such as: Capacitor voltage, max system voltage, charge level, operating status. This window is used to build tests as well.

Figure 18

In the EMA status window, user also has 6 buttons which controls the EMA:

1. – refreshes EMA status(capacitor voltage, charge level, operating status)
2. Arm – charges the capacitor bank of the EMA.
3. Disarm – discharges the capacitors on the EMA and sets EMA to idle mode.
4. Reset dyno – resets the dyno from the emergency state (if the emergency button was engaged previously).
5. Tare position - Tares the position.
6. Tare force - Tares current force.
7. Start - Starts the test.

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. EMA test builder

After project is created, it is time to build first test using test builder (Figure 19).

Figure 19

9.5. Control loop configuration

The user is also allowed to adjust the PID algorithms according to his needs. The detailed instruction on adjusting the PID is included in the other document which comes with the EMA.

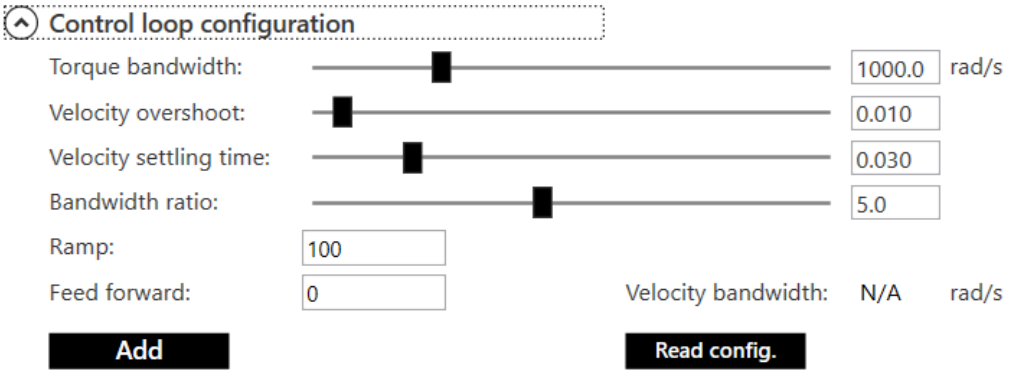

Figure 20

9.6. System configuration

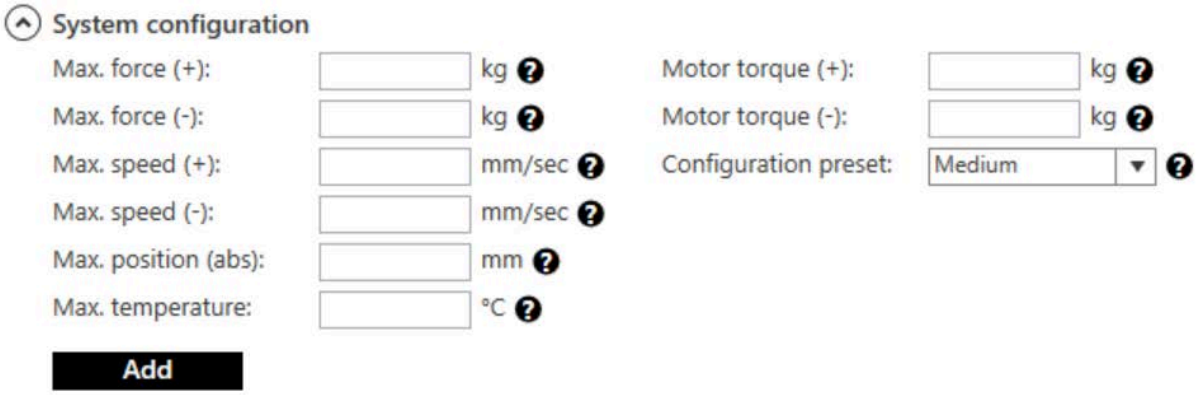

Figure 21

In system configuration the user defines the limits of the test, such as:

- Max. force (+) – maximum allowed compression force.
- Max. force (-) – maximum allowed rebound force.
- Max. speed (+) – maximum allowed compression speed.
- Max. speed (-) – maximum allowed rebound speed.
- Max. position (abs) – maximum absolute position of the dyno mast.
- Max. temperature – maximum allowed temperature during the test.
- Motor torque (+) – the maximum torque the motor will provide in compression cycle.
- Motor torque (-) – the maximum torque the motor will provide in rebound cycle.

After desired configuration parameters are entered, user has to press Add

9.7. Gas pressure force calibration

Figure 22

In gas pressure force calibration menu, the user defines how the gas pressure force should be measured. This step is optional, if the user does not care about the gas pressure force, this step

can be skipped. To setup the gas pressure force calibration, the user has to define parameters such as:

- Start position (abs.) – the position at which the gas pressure force calibration will start.
- End position (abs.) – the position at which the dyno will stop compressing the damper.
- Reversal (abs.): the distance the dyno will go above end position, to flip the seals of the damper before going back.
- # of steps/points – number of force measuring points.
- Speed – the speed on which the gas pressure force calibration will be executed.
- Halt time- the duration of every measurement step.
- Delay - the amount of time the dyno will wait to start a new run, once the gas pressure force calibration is done.

After the desired gas pressure calibration parameters are entered, user has to press **Add**

9.8. Warmup

Figure 23

Warmup configuration menu is used to setup the warmup run. This is also optional. To setup a warmup run, user has to define parameters such as:

- Target temperature – the target temperature of the damper.
- Preload – the amount of preload which will be used for warmup test
- Stroke – amount of displacement which will be used during warmup run execution.
- Speed – speed on which warmup run will be executed.
- Max time – time limit of the warmup test. If the damper won't reach the target temperature in defined max. time – the warmup test will be shut off.
- Delay – amount of time the dyno will wait to start a new run, once warmup run is finished.

9.9. Interval

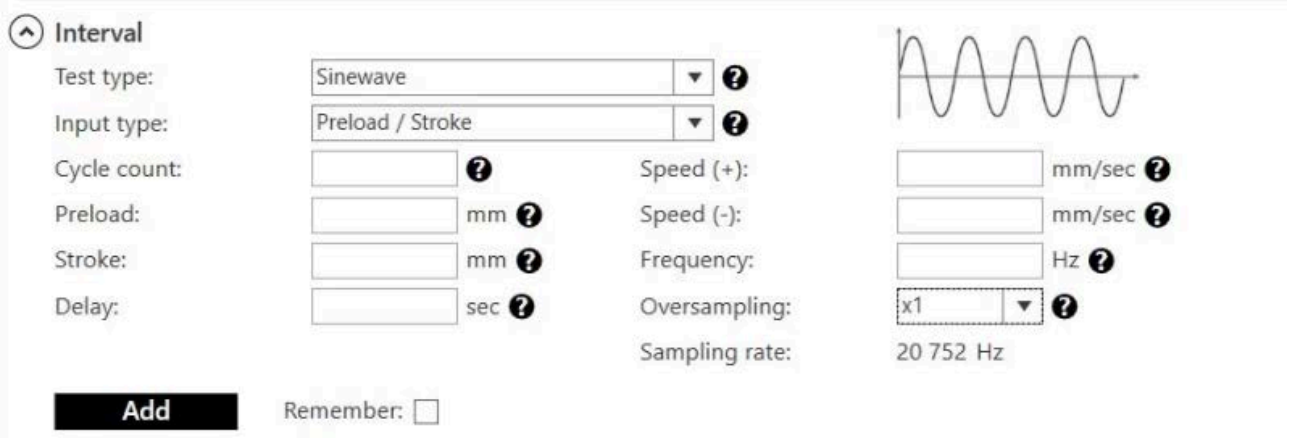

Figure 24

In interval section the user defines the actual parameters of the test itself, such as:

- Test type – user can choose between sinewave, constant velocity and constant acceleration test types. Once the type is selected, the user can see the waveform of the selected test type in the right side.
- Input type – preload/stroke or offset/amplitude.
- Cycle count – the number of cycles which will be executed with this test type.
- Preload – the preload distance which will be executed before starting the test.
- Stroke – the amount of displacement which will be used during test.
- Speed (+) – speed of the compression cycle.
- Speed (-) – speed of the rebound cycle.
- Frequency – shows the frequency of the test waveform
- Oversampling – user is allowed to select the sampling rate of the sensors. The sampling rate in Hz is shown below.
- Delay – amount of time the dyno will wait to start a new run, once current one is finished.

After desired interval parameters are entered, user has to pre **Add** .The user is allowed to add more than one testing intervals with different types and parameters.

9.10. Impulse

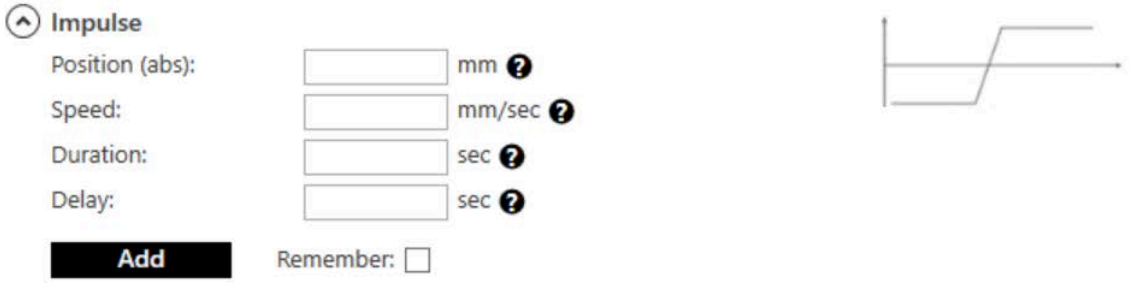

Figure 25

Impulse is a type of test, which does not get repeated. To setup impulse test, user has to define parameters such as:

- Position – absolute position at which the impulse will stop.
- Speed – speed of the impulse.
- Duration – time amount which the dyno will hold the damper at the end position of the impulse.
- Delay – amount of time the dyno will wait to start a new run, once current one is finished.

9.11. Custom

Figure 26

Custom interval test allows the user to upload and simulate track data or generate a pink noise waveform. To make this type of test, the user has to press Configure

9.12. Creating track data test

In order to setup track data test, the user has to follow steps presented below

1. Select CSV format according to the telemetry device the user used.(Figure 27 – Step 1)
2. Select units. (Figure 27 – Step 2)
3. Press **Select** and select the file you want to use for the test.(Figure 27 – Step 3)
4. Once the file is selected, the user will see the displacement curve of the file.
5. Select filtering (optional). (Figure 27 – Step 4)
6. Select the end – front or rear (Figure 27 – Step 5)
7. If the user does not need to simulate the whole file, he is allowed to trim the it. To do that, press and hold shift-key, set the first trimming line on the desired place of the curve (Figure 27 – Step 6), then, while the shift-key is still being pressed, set the second trimming line (Figure 27 – Step 7)
8. The user is also allowed to manually set the minimum position of the damper (Figure 27 – Step 8)
9. Press **Apply** (Figure 27 – Step 9)
10. Press **OK**
11. Press **Add**

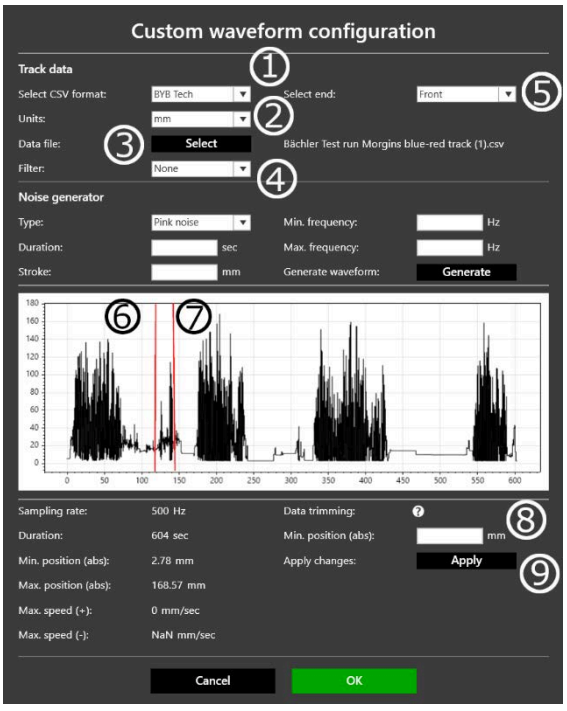

Figure 27

9.13. Noise generator

Our software allows user to generate three types of noises: sweep, chirp, pink noise

1. Select noise type. (Figure 28 – Step 1)
2. Enter the duration of the test. (Figure 28 – Step 2)
3. Enter the stroke of the test. (Figure 28 – Step 3)
4. Enter the minimum frequency (Figure 28 – Step 4)
5. Enter the maximum frequency (Figure 28 – Step 5)
6. Press Generate
7. Press OK
8. Press Add

Figure 28

9.14. Starting the test

Once the user finishes building his test sequence, to start test he has to follow the steps below

1. Arm the dyno by pressing **Arm**
2. Enter test name.
3. Enter test comment(optional).
4. Press **Start**

In order to stop the running test, user has to press **Stop**

9.15. Graph comparison - EMA data mode

The user has 2 options how to look at graphs: EMA and shock dyno mode. This section describes the EMA data mode. To switch between modes, the user has to locate **Options** button in the top, after pressing it, from the “data mode” drop down menu select the desired data mode.

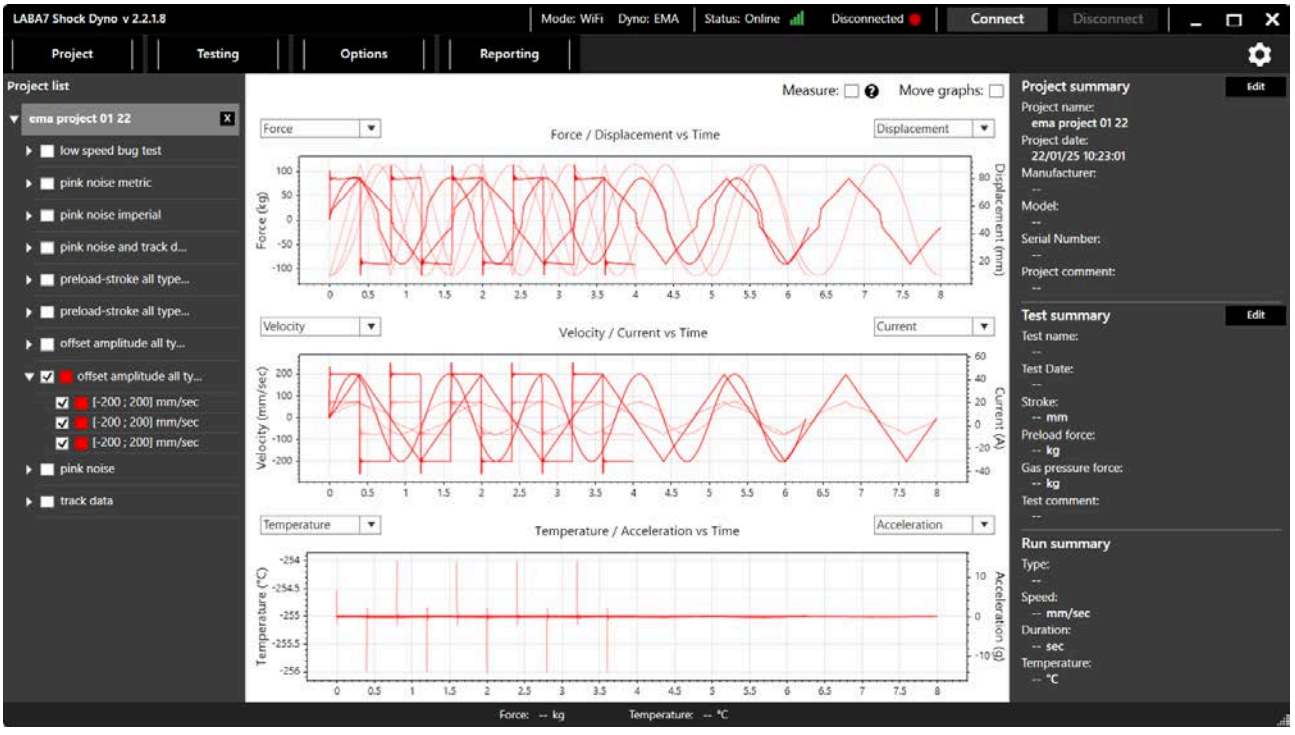

Figure 29

In EMA data mode, user is allowed to look at 6 curves at once. The user can select from 6 types of curves:

- Force
- Displacement
- Velocity
- Current
- Temperature
- Acceleration

To view graphs user has to select them in the project list, on the left side of the software window. By clicking on Measure: ☑ checkbox in the top right corner, user can enable some measuring tools presented in the Figure 28 below.

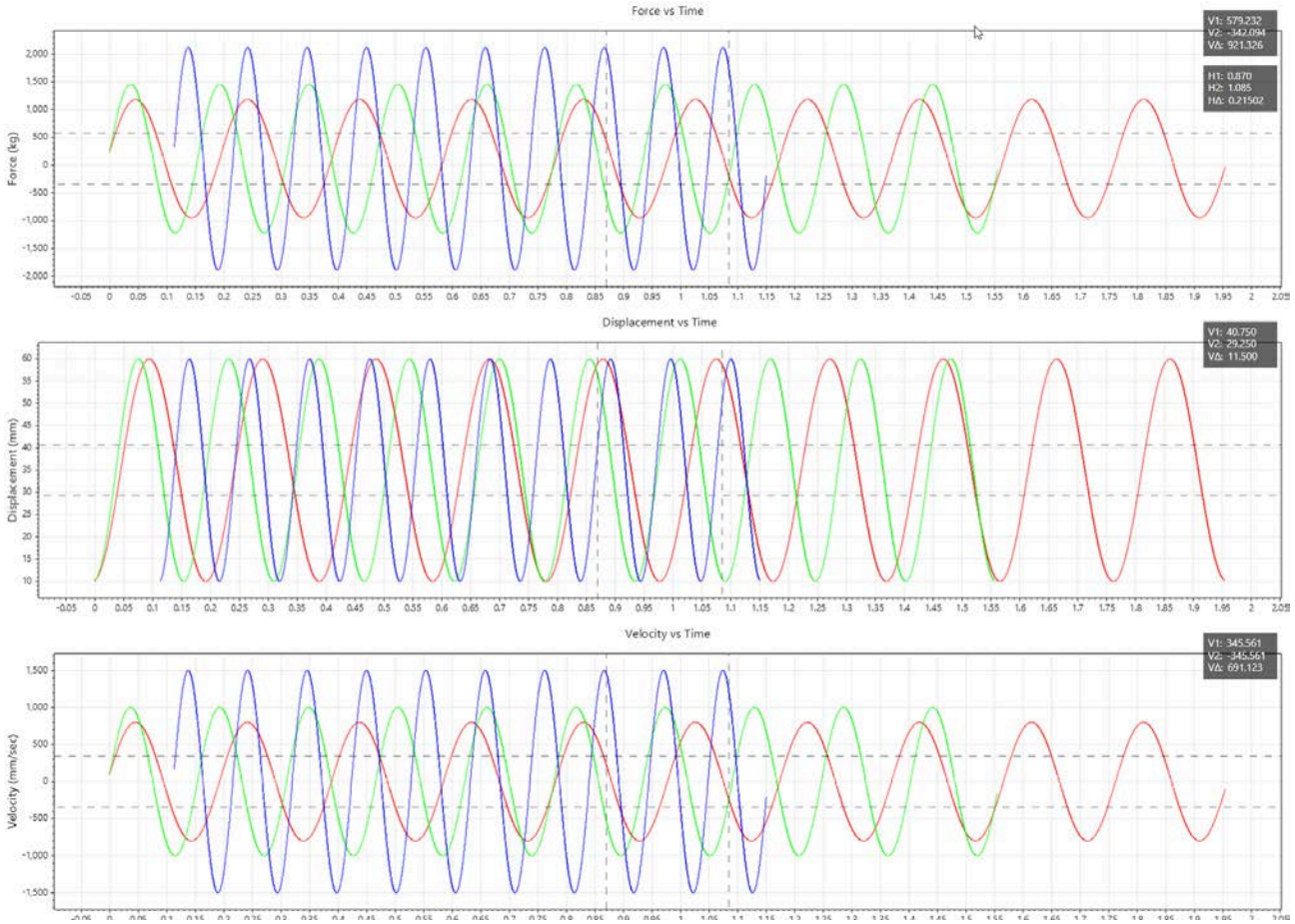

Figure 30

The user is also allowed to move the graphs in horizontal axis by clicking on Move graphs: ☑ then, clicking on and dragging the desired graph. Comparison between original and moved graphs is showed in the Figure 29 below.

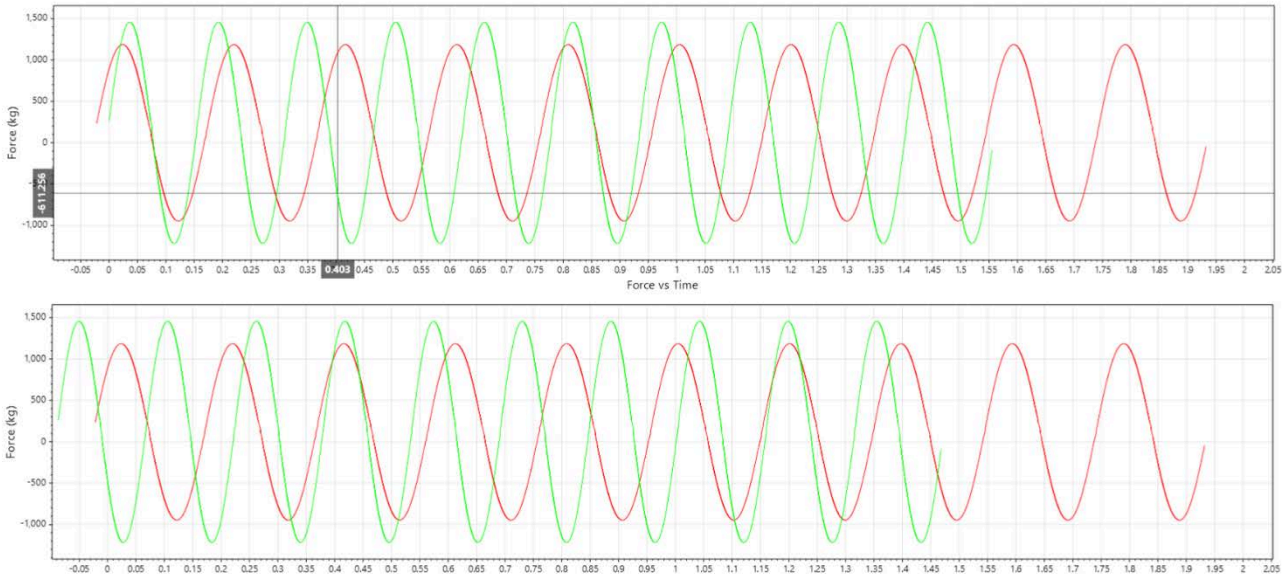

Figure 31

9.16. Enabling the original curve

The user is also allowed to look at the original curve, which was sent to the dyno to execute and compare it to the actual executed curve. To do this, user has to right-click on the run, which original curve wants to see and select “show original waveform”. The original curve is represented in dotted line.

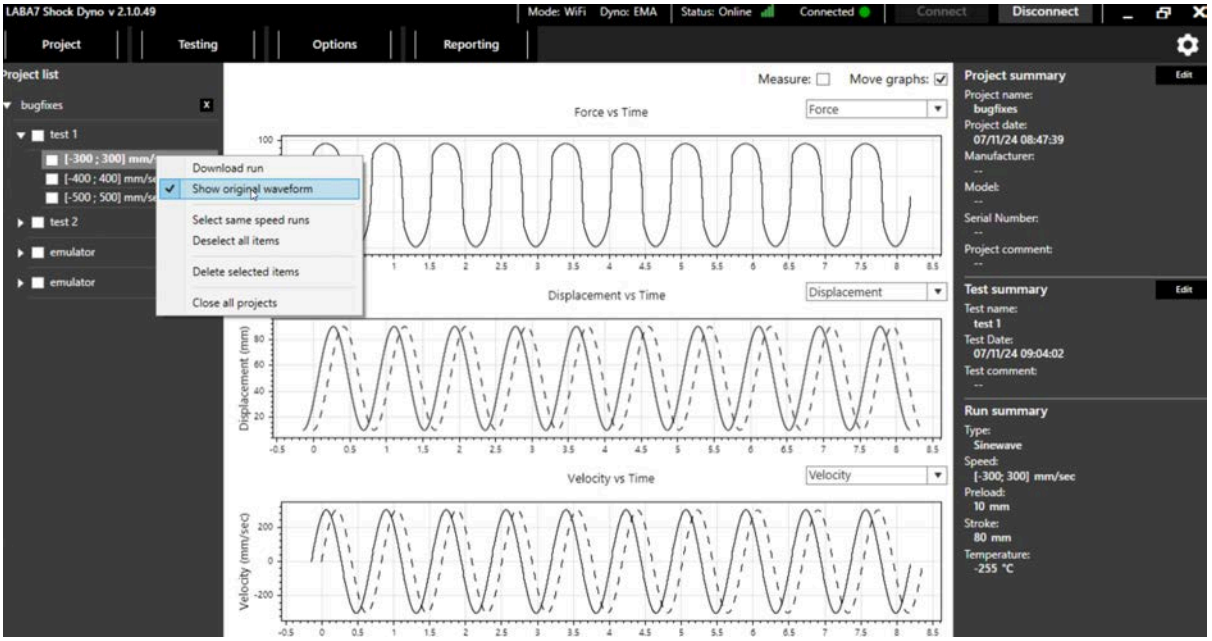

Figure 32

9.17. Graph Comparison Shock Dyno mode

The user is also allowed to look at graphs made with EMA, in shock dyno mode. To turn on this mode, us Cancel sting window by pressing Cancel button in the top, then locate Options button, and from “data mode” drop down menu, select the shock dyno data mode.

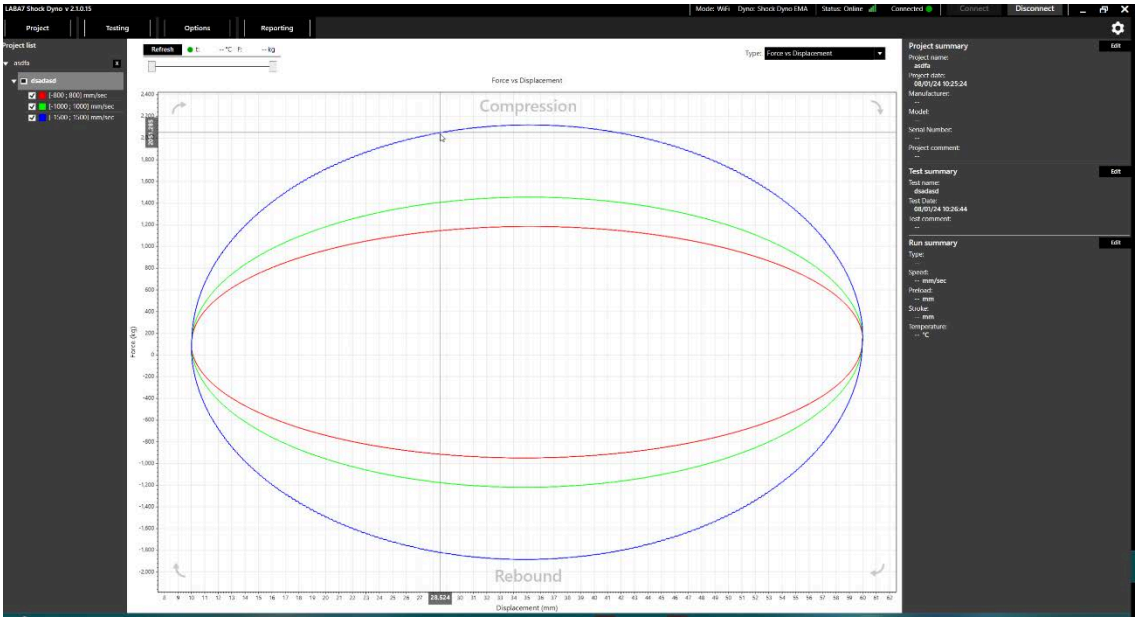

Figure 33

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 see data values at specifix data points, user has to hover over desired graph point and the exact values of both axis will be shown.

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.

9.18. Graph Types, Shock dyno mode

This section describes the different graph types available for each test in shock dyno data mode.

Force vs Displacement

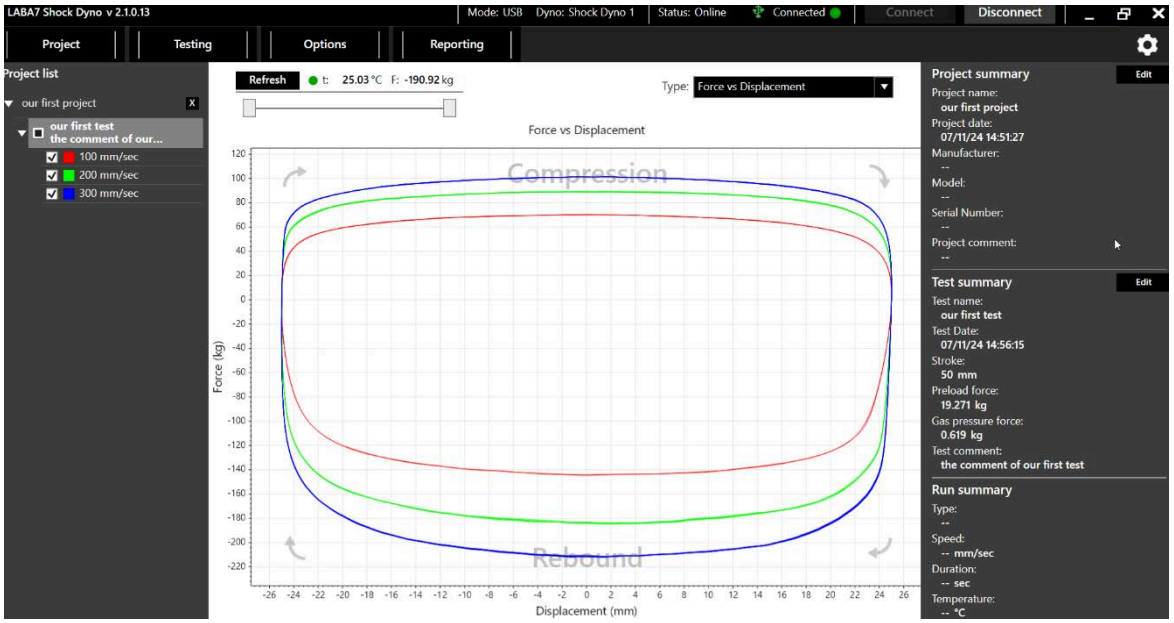

Figure 34

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

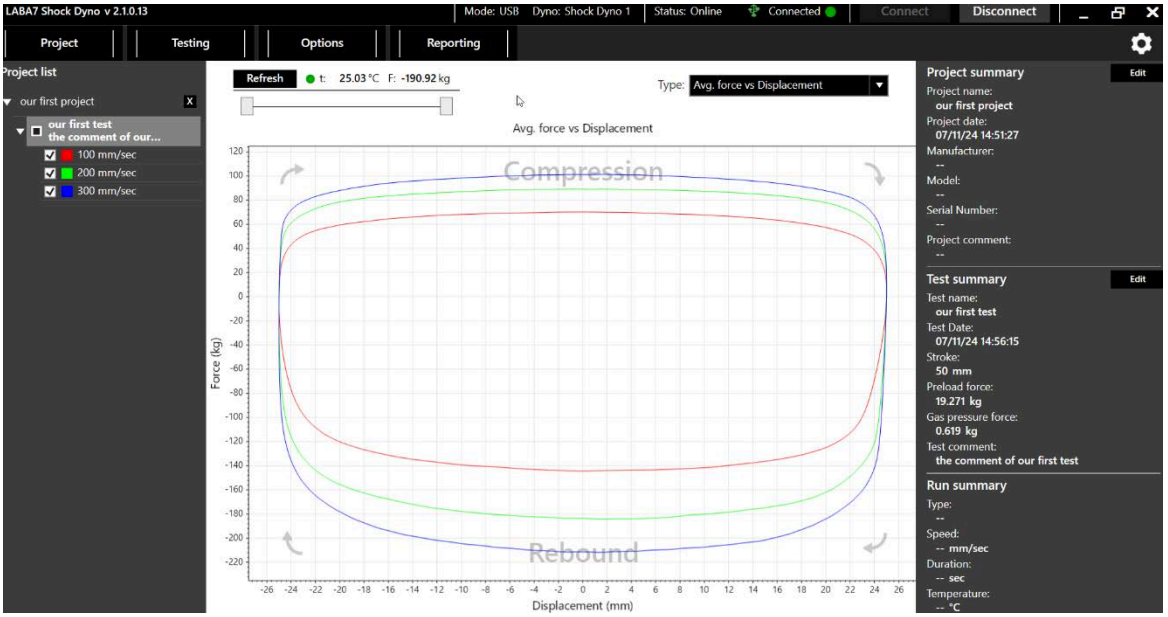

Figure 35

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

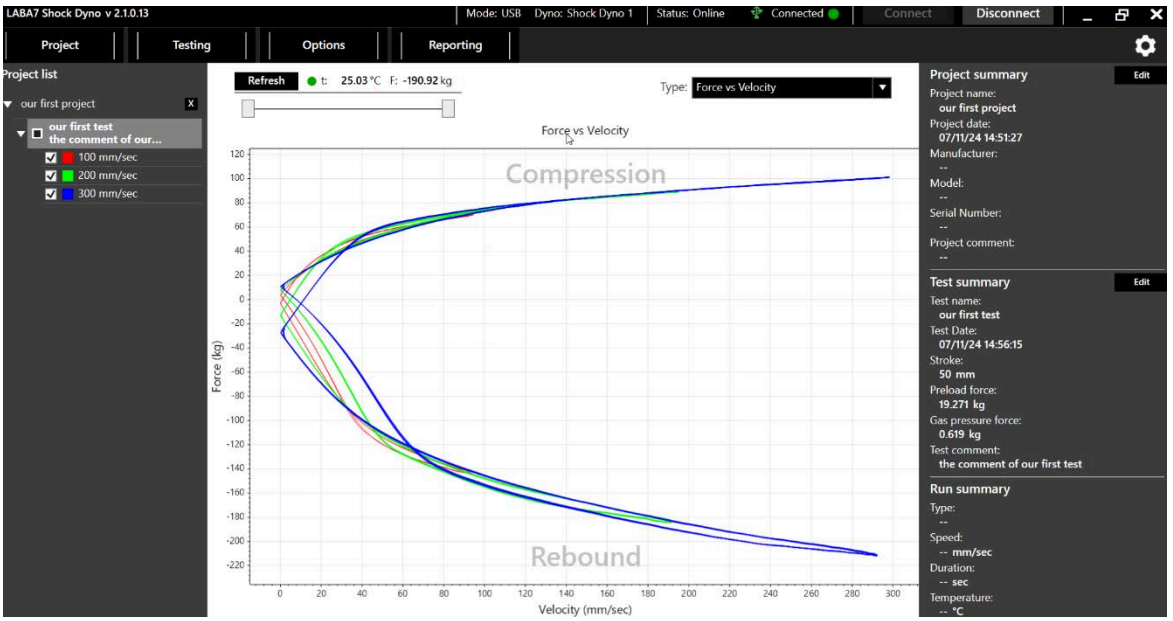

Figure 36

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

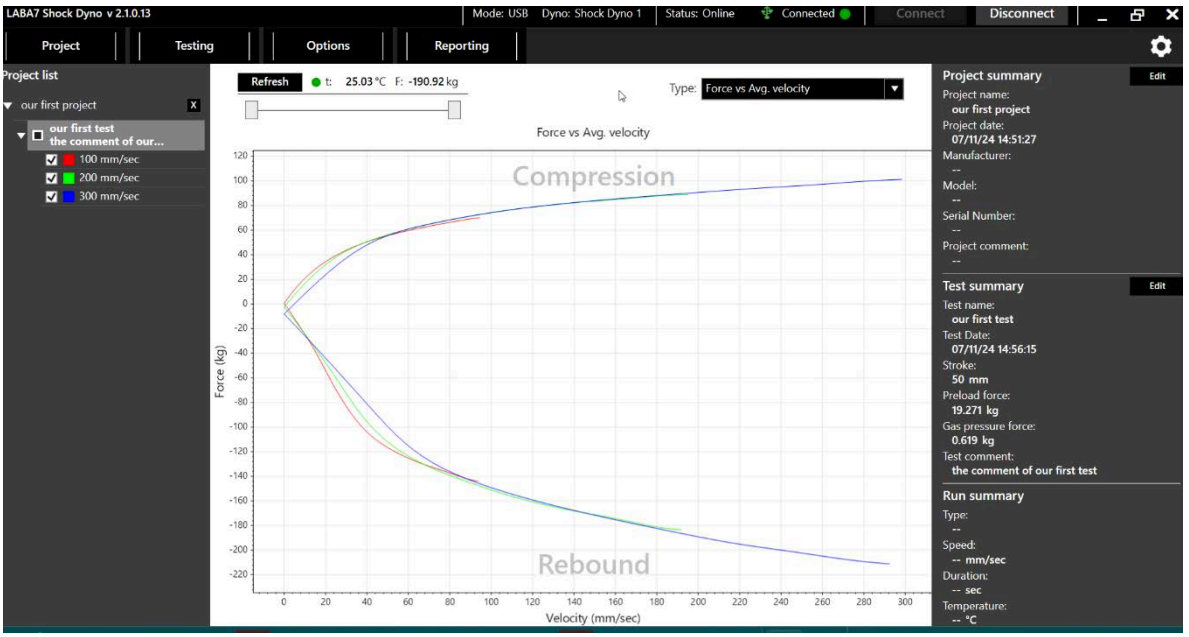

Figure 37

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

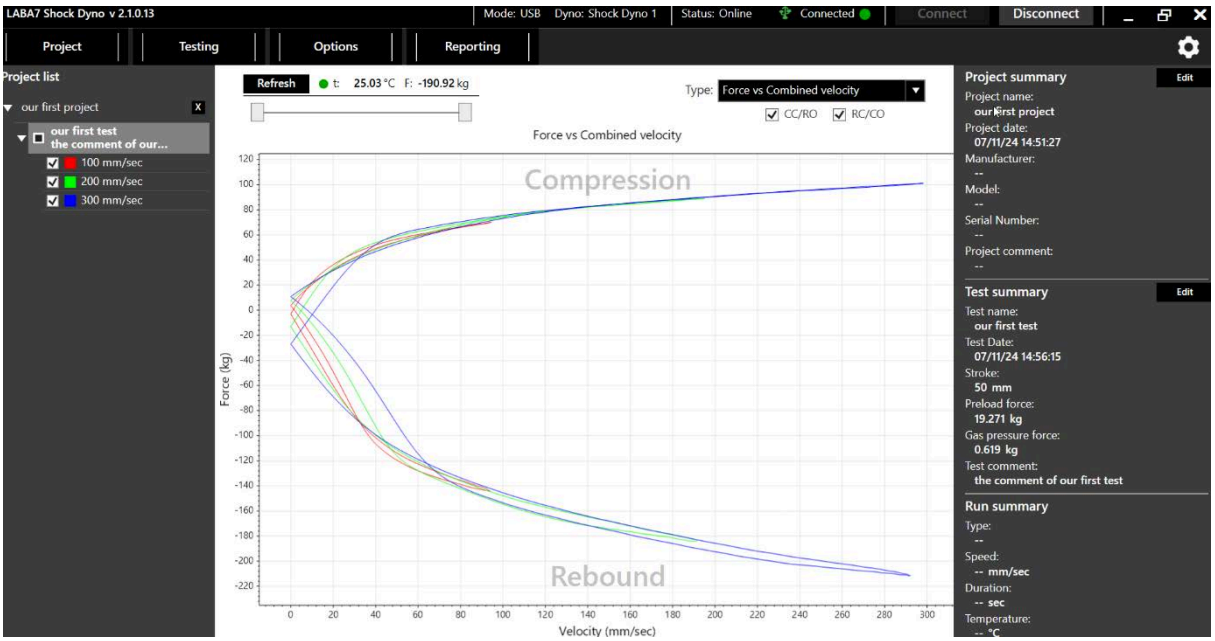

Figure 38

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

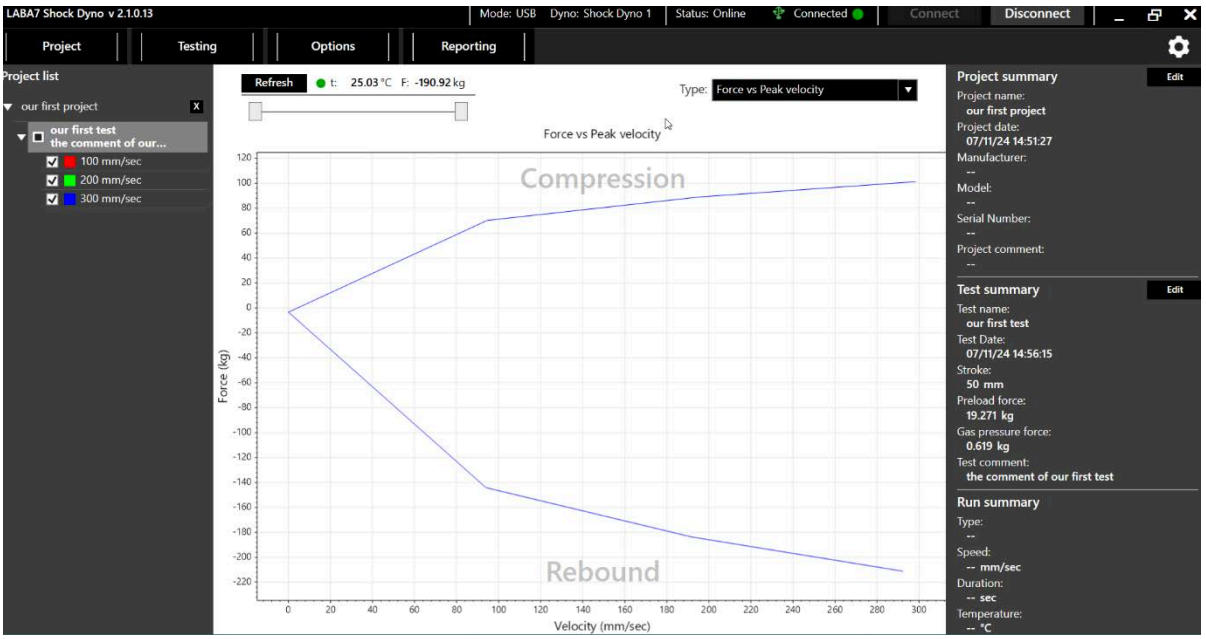

Figure 39

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 40

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

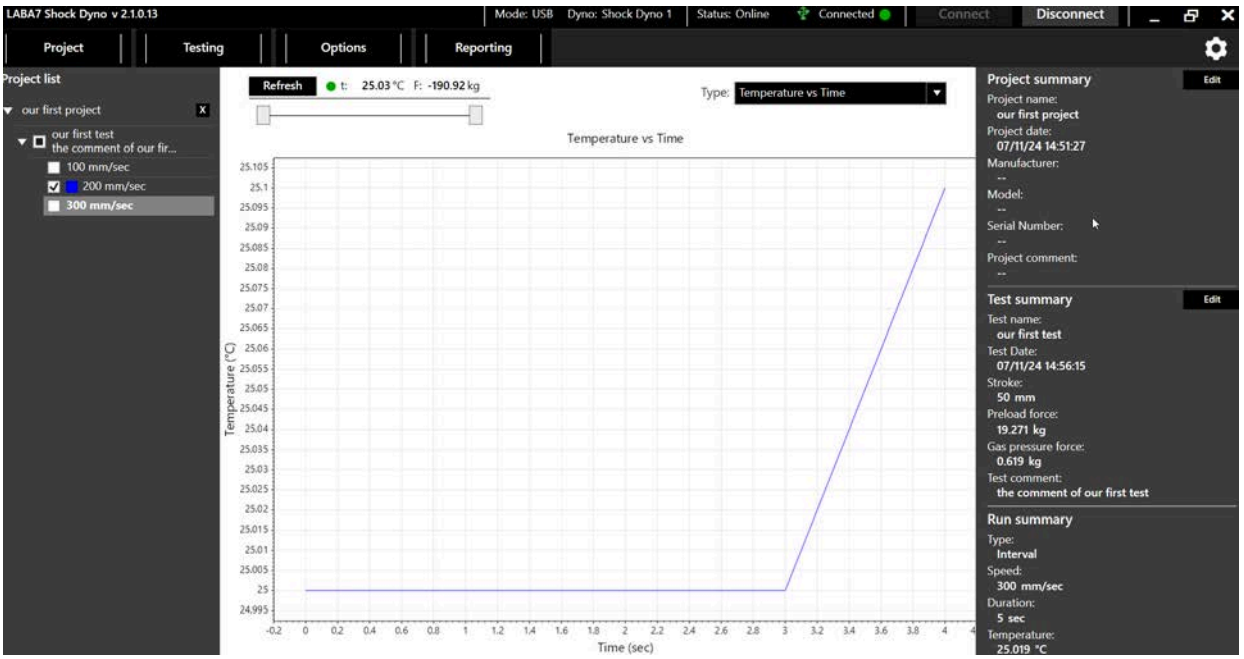

Figure 41

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.

9.19. 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.

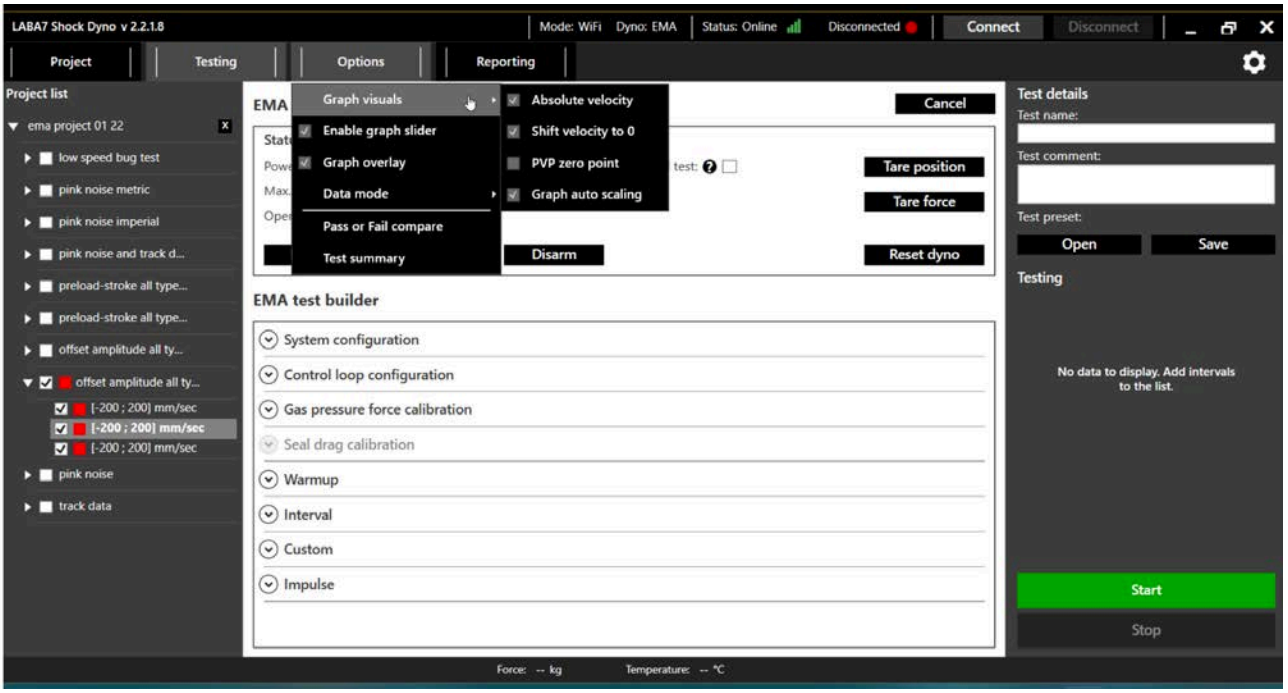

Figure 42

- 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.

9.20. Save and open EMA test presets

In order to save a preset user has to make a test in test builder, and after adding all of the runs, press **Save** button, which is located below the test comment window.

In order to upload previously saved preset, user has to press **Open** which is located next to preset save button.

9.21. 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”

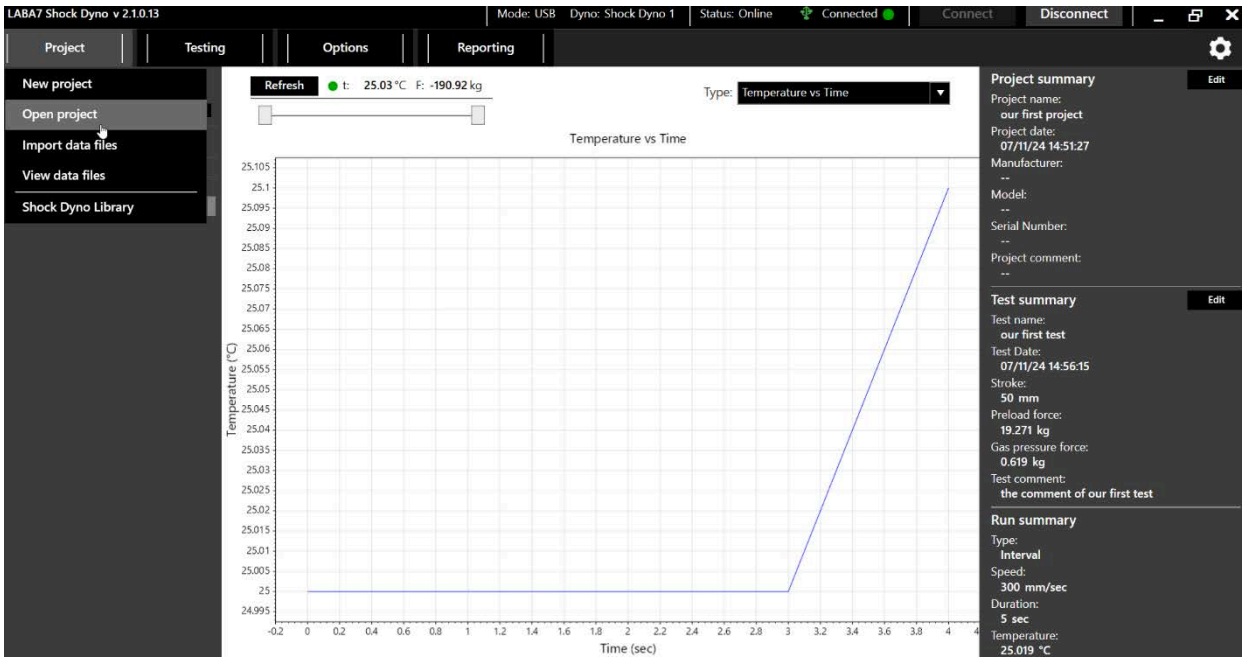

Figure 43

9.22. Force eliminations and other test related data

The user is allowed to edit the test summary, to do that, user has to locate test summary, which is in the right side of the screen and press **Edit**

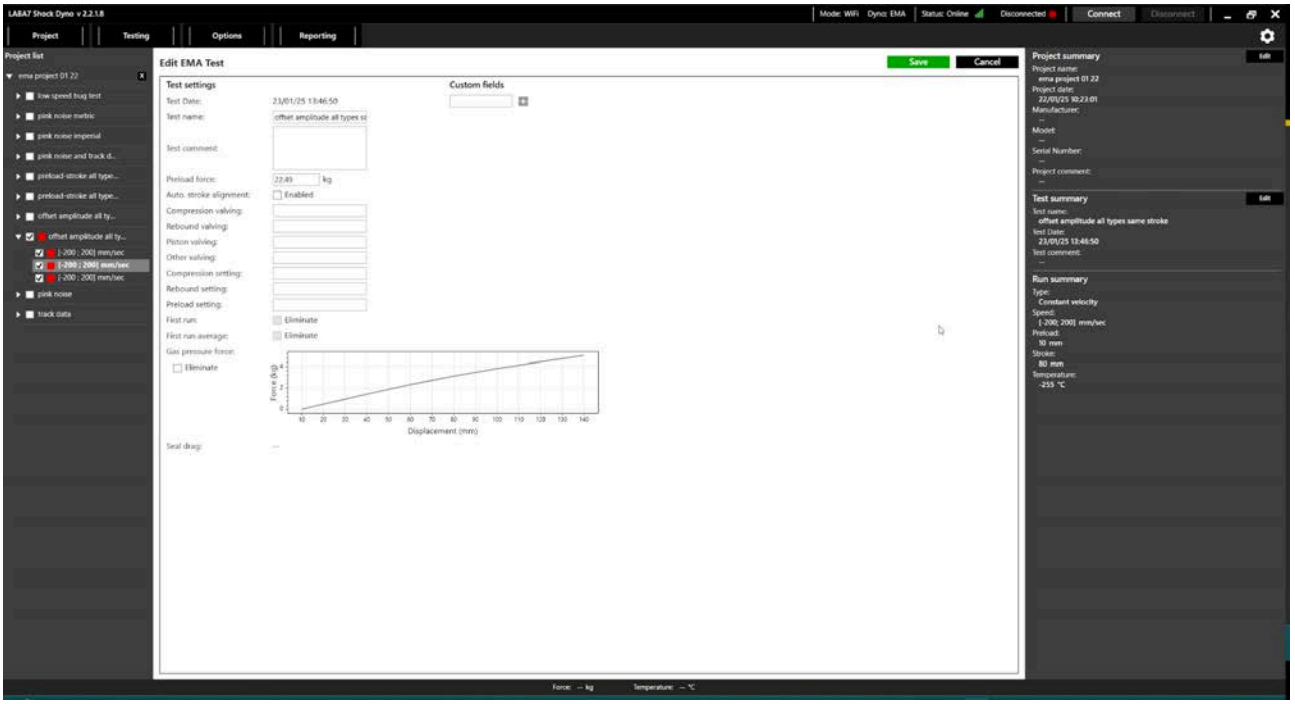

Figure 44

In test summary, user is allowed:

- Edit test name.
- Edit test comment.
- Check the preload force and edit it.
- Enable auto stroke alignment, for tests with various stroke runs.
- Enter compression valving data.
- Enter rebound valving data.
- Enter piston valving data.
- Enter data about other valving.
- Enter comment about compression setting.
- Enter comment about rebound setting.
- Enter comment about preload setting.
- Eliminate gas pressure force.

- Eliminate first run average. (the average force of the first run gets eliminated from all the upcoming runs of the test).
- Add some additional fields to enter more needed data about the test. This data can be saved for upcoming tests, by clicking on “save” icon.

9.23. 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.

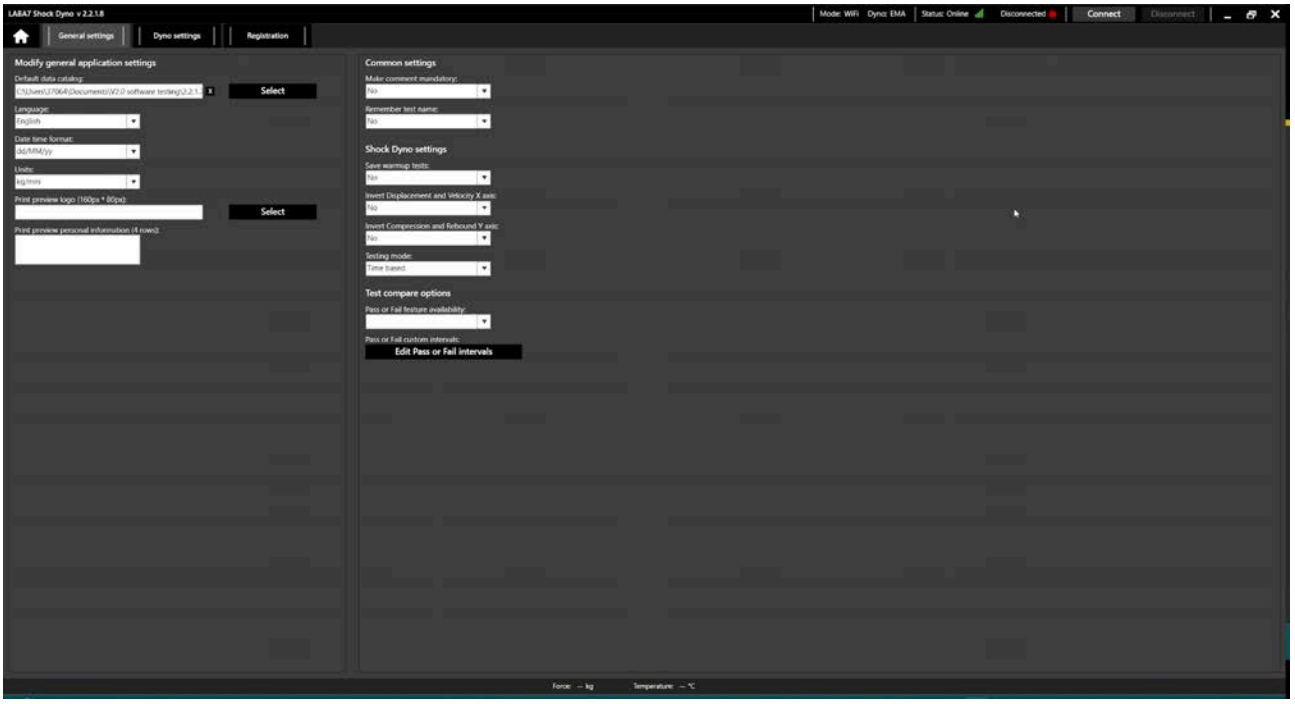

Figure 45

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 vertical axis – inverts the vertical axis of the graphs.
- Invert horizontal axis – inverts the horizontal axis of the graphs.
- Testing mode – select the interval mode, cycle based or time based.

Registration

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

9.24. Reporting

The application is capable of printing test reports to .pdf file. Different data modes (Shock dyno and EMA) offers different types of reports.

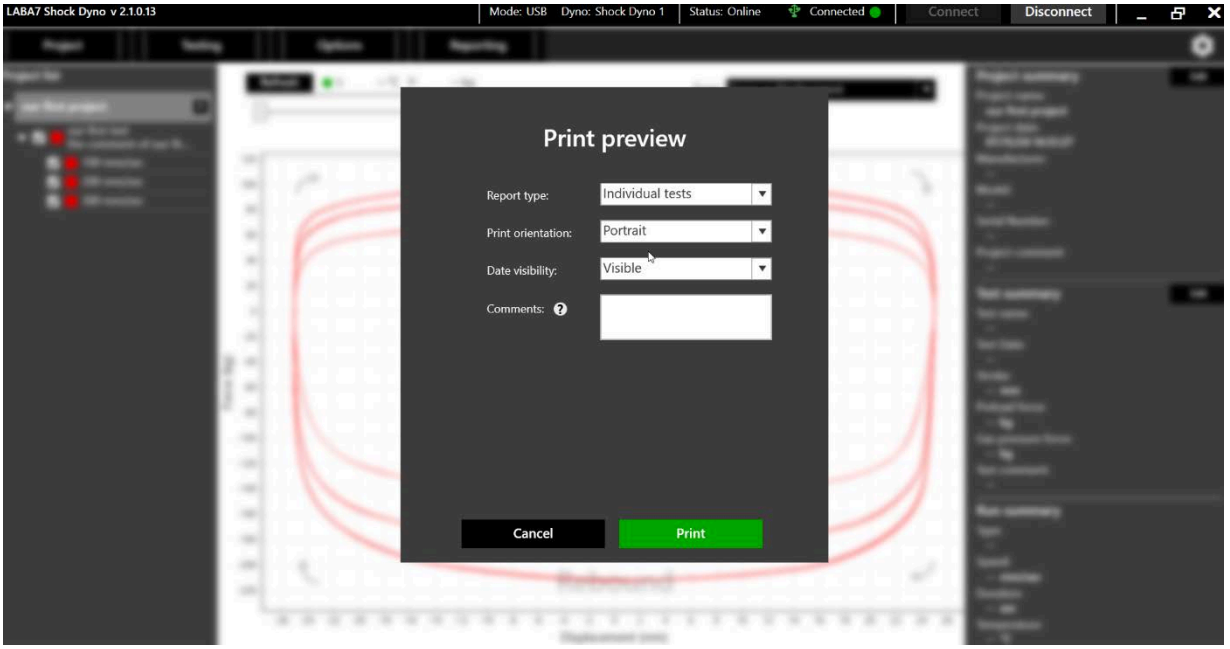

Figure 46

Individual tests report type (Shock dyno mode)

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 (Shock dyno mode)

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 (Shock dyno mode)

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 (Shock dyno mode)

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.

EMA graph (EMA mode)

Ema graph includes force vs time, displacement vs time and speed vs time graphs. To print EMA graph, user has to complete following steps:

1. Select desired runs which you want to include in the report
2. Press “reporting”, then “print”
3. Select EMA graph type
4. Select orientation
5. Select date visibility
6. Enter a comment if needed
7. Press 

10. Data Export and Import

The software is capable of exporting and importing test data from or to .csv file. There are 3 options of export: export interval, export PVP and export Avg.velocity. To access this functionality, press “reporting” in the main menu.

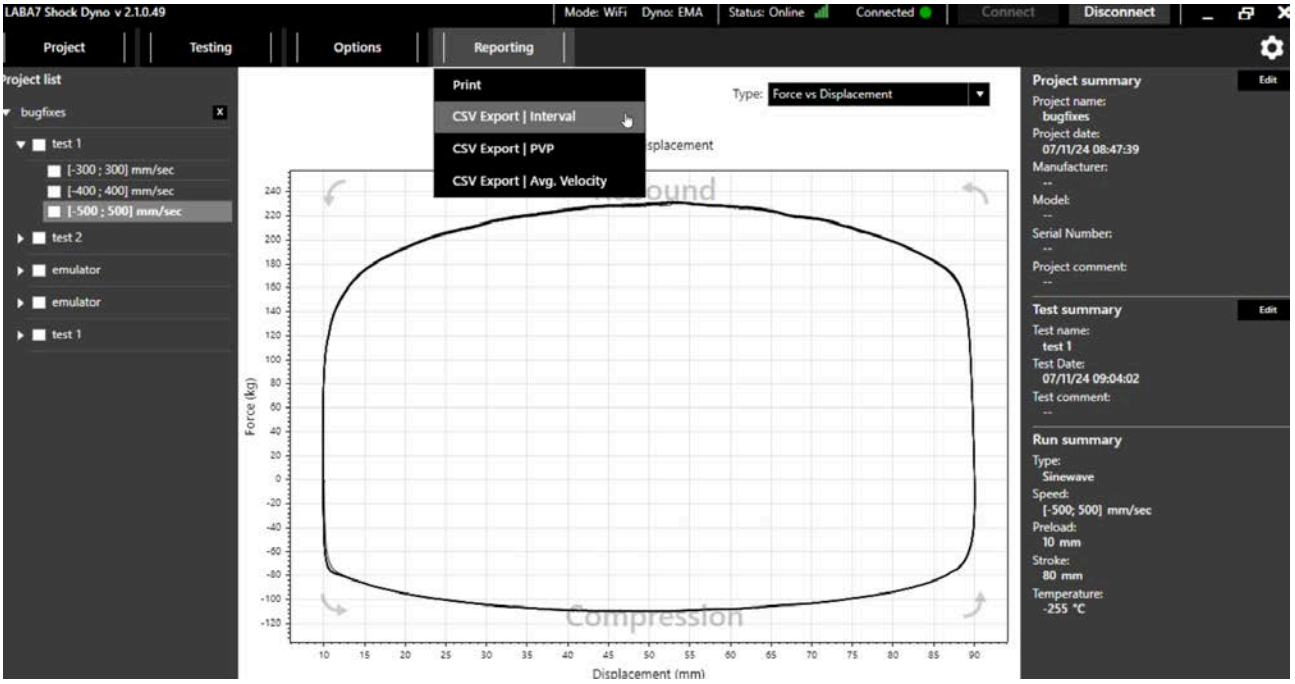

Figure 47

Export interval

To export separate intervals, follow these steps:

1. Select one or more test runs from the project list.
2. Press reporting (Figure 46).
3. Select 

Export PVP

To export peak velocity plot data, follow these steps:

1. Select multiple runs or whole test.
2. Press “reporting” (Figure 46).
3. Select 

Export Avg. velocity

To export average velocity graph, follow these steps:

1. Select the run you want to export.
2. Press “reporting”(Figure 46)
3. Select 

Importing

The software allows user to import .csv files, old laba7 files and some files from other manufacturers.
To import mentioned files, user has to follow these steps:

1. Press on “project” in the top left corner.
2. Click on 

3. Select the imported files the user is interested to take a look at.

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

1. Press on “project” in the top left corner.
2. Click on 

3. Select the files user wishes to view.

11. 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.

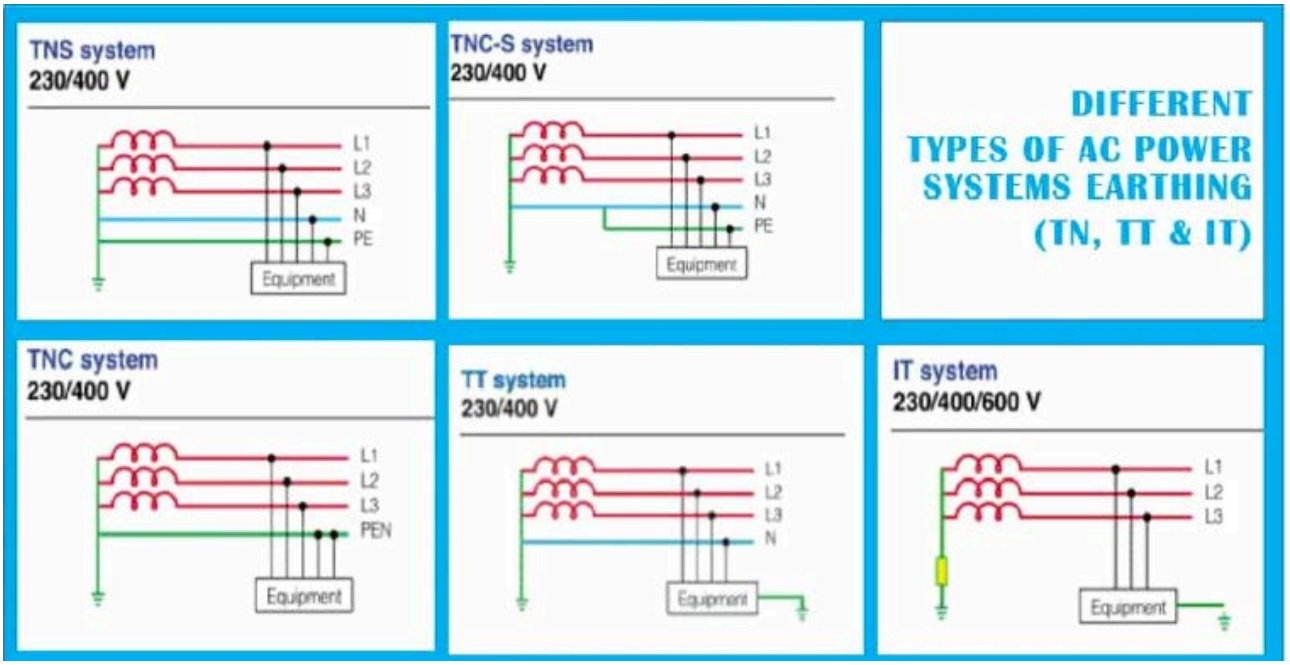

Figure 48

12. 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.

12.1. 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 by powering it off.
Application is frozen or stuck on a Please Wait dialog and cannot be closed.	Close the application through the Task Manager.
Dyno stops during the test, and when running another test, dyno is not running, only noise is seen on the graph.	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.

12.2. Wi-Fi Configuration

Issue	Solution
Cannot configure Wi-Fi parameters.	The communication mode in Dyno is incorrect. Change the communication mode.
Cannot connect to router.	The router might not allow new connections; check the router settings or restart it.
Cannot connect to router. Dyno is connected but status appears to be	Check for typos, if caps lock is enabled, re-enter credentials.

offline.	Computer is not connected to the same network as the Dyno. Reconnect device to the same network or reconfigure the Dyno.

12.3. 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 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.
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.

12.4. 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	Check if the power grid cable is compatible with the

with software	socket.
The device power switch does not light and the device does not start.	Contact LABA7 support.

12.5. Screen indicator

Screen	Meaning
Yellow color bar	Dyno is ready.
Red color bar	Dyno is in emergency state. Check if emergency button is released ant press “reset” in the application.
green color bar	Dyno is executing test.
wLan IP:xx.xx.xx.xx	Dyno is connected to wi-fi and ready to run.
LAN IP:xx.xx.xx.xx	Dyno is in LAN communication mode and ready to run.

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

13. Warranty Information

LABA7 Shock Dyno EMA 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.

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