



**SPRINGANALYZER V0.3**

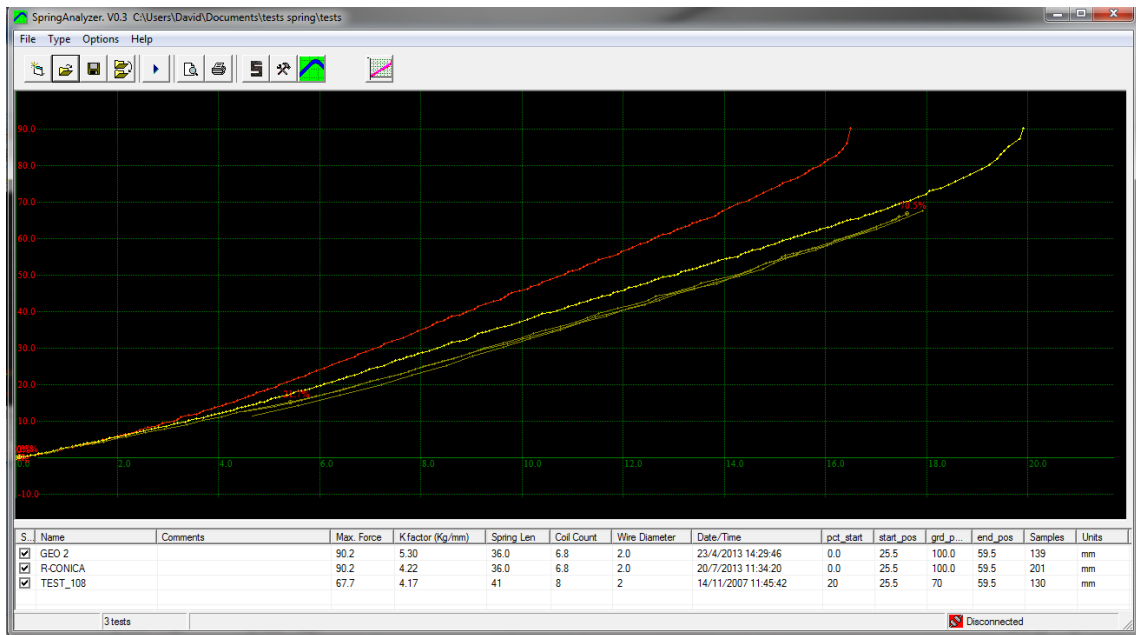
**USER'S MANUAL**

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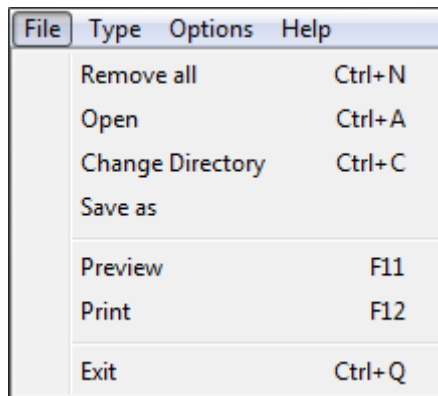
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## 1 SpringAnalyzer Software.



### 1.1 The Menu

#### 1.1.1 File Menu



**Remove All.** It removes all tests from the memory, but not from the disk.

**Open.** It shows a window to choose the tests to be loaded in memory. It is possible to load them one by one or several at once.

**Change directory.** It allows changing the directory where tests are automatically saved. Current directory is shown in the title of the window (upper text).

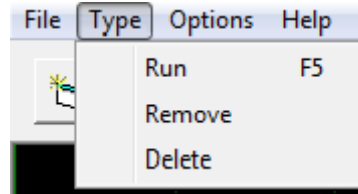
**Save as.** It allows saving the test with a different name or in a different place.

**Preview.** It shows a preview in the screen of the tests in the same way as they will appear in the printer.

**Print.** It prints the selected tests. It shows a window so the user can first choose and configure the printer.

**Exit.** It exits from the program.

### 1.1.2 Type Menu

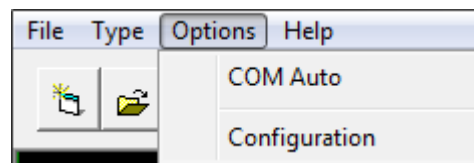


**Run (F5).** It shows the 'Input Data' window. In this window the user will enter the data for the test. Then, the user can start the test by clicking over the 'Ok' button.

**Remove.** It removes the selected test from the program (not from the disk).

**Delete.** It deletes the test run from the program **and from the DISK**. Be careful.

### 1.1.3 Options

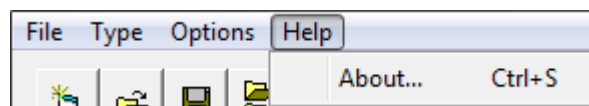


**COM Auto.** It will open the 'Automatic COM Port Selection' window. The process will search a data transmission from ShockAnalyzer unit at every port. When it is received it will be shown in green. If none receives data the user should check if there is another program using the COM port, and repeat the process.

It is very useful when used with USB adaptors, where the COM id is a pseudo-random number.

**Configuration.** It shows a window with the program configuration, it is explained below.

### 1.1.4 Help Menu



**About.** It shows information about SportDevices, developer of the software and manufacturer of the unit.

## 1.2 The Button Bar



By clicking over these buttons the user can do more quickly the same actions that using the menu. Options are:

**Shinning sheet: New.** File/new menu.

**Open Folder: Open.** File/open menu.

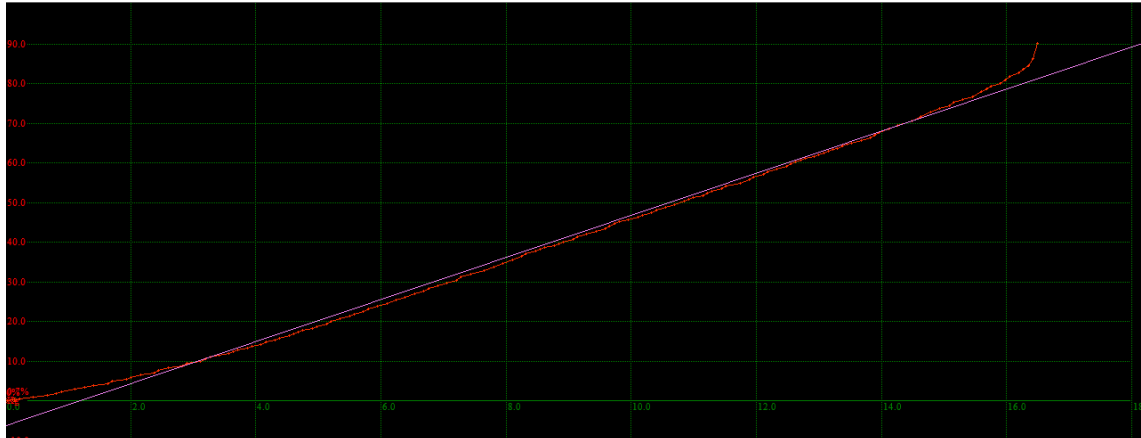
**Disk: Save as.** It saves the test with another name or in another directory.

**Two folders: Change directory.** File/change directory menu.

**Play: Run.** Test / run menu. (F5 key)

- Sheet & glass:** **Preview.** File/preview menu (F11 key)
- Printer:** **Print.** File/print menu (F12 key)
- Load Cell:** **Load Cell Wizard,** see section 2.
- Tools:** **Configuration.** It opens program configuration window.
- SportDevices icon:** **About.** Help/about menu.
- Linear Regression Button.** See below.

### 1.3 Linear Regression



This button shows the linear behaviour of the spring with the constant *k* factor computed to compare whether it is representative or not.

### 1.4 Test Columns

S	Name	Comments	Max. Force	Kfactor (Kg/mm)	Spring Len	Coil Count	Wire Diameter	Date/Time	pct_start	start_pos	grd_p	end_pos	Samples	Units
<input checked="" type="checkbox"/>	GEO 2		90.2	5.30	36.0	6.8	2.0	23/4/2013 14:29:46	0.0	25.5	100.0	59.5	139	mm
<input type="checkbox"/>	R-CONICA		90.2	4.22	36.0	6.8	2.0	20/7/2013 11:34:20	0.0	25.5	100.0	59.5	201	mm
<input type="checkbox"/>	TEST_108		67.7	4.17	41	8	2	14/11/2007 11:45:42	20	25.5	70	59.5	130	mm

The following data is shown for every loaded test, by double-clicking over the row the data window will be displayed, and the user can change some of these data

**See,** the user can check / uncheck this column to show / hide the test.

**Name,** name of the test.

**Comments,** comments for the test.

**Max. Force,** maximum force detected during the test (Newtons or Pounds).

**K Factor,** compression constant characteristic of the spring (Kg/mm or Lb/in). It represents its stiffness.

**Spring Len,** is shows the length of the spring (mm or inches).

**Coil count,** the number of coils in the spring.

**Wire diameter,** the wire diameter in mm or inches.

**Date/Time,** date and time when the test was done.

**pct\_start,** it shows the start percentage of the test.

**start\_pos,** it shows the start position of the test

**pct\_start,** it shows the start percentage of the test

**pct\_start,** it shows the start percentage of the test

**Samples,** it shows the amount of samples taken in the test.

**Units,** it shows the units of measurement used for the test (mm or inches).h speed.

## 1.5 Test Data Window

This window is used to enter data when a new test is going to be recorded.

The screenshot shows a software window titled "Enter Data For New Test". It has a standard Windows-style title bar with minimize, maximize, and close buttons. The window is split into two panes. The left pane, titled "Test details", contains several input fields: "Name" (text box with "TEST\_007"), "Coil Count" (spin box with "5"), "Wire Diameter" (spin box with "3" and "mm" label), "Spring Length" (spin box with "100" and "mm" label), "Max. Displacement" (spin box with "85.0" and "mm" label), "Start Percentage" (spin box with "30%"), "Start Position" (spin box with "25.5" and "mm" label), "End Percentage" (spin box with "70%"), and "End Position" (spin box with "59.5" and "mm" label). Below these fields is a large empty text area for comments. At the bottom left of this pane is a checked checkbox labeled "Remove last tests". The right pane, titled "On line", displays real-time data: "Position" (text box with "0.0" and "mm" label), "Percentage" (text box with "0.0" and "%" label), and "Force" (text box with "0.0" and "Kg" label). Below these is a green button labeled "Zero" with a small spring icon. At the bottom right of the window is a large green button labeled "Start".

Once all the data is entered correctly, click the “Start” button to proceed with the test. See 1.5.3. *Recording data.*

### 1.5.1 Test Details.

**Name.** Here the name for a new test has to be entered. The program increases the ending number of test name every time a test is done.

**Coil count.** The user must enter the number of coils of the spring.

**Spring length.** The user must enter the length of the spring in mm or inches. The measurement units can be modified in *Options > Configuration*, or clicking in the *Tools* button in the toolbar.

**Start percentage.** The user must enter the start percentage.

**End percentage.** The user must enter the end percentage.

**Wire diameter.** The user must enter the diameter of the spring in mm or inches. The measurement units can be modified in *Options > Configuration*, or clicking in the *Tools* button in the toolbar.

**Max displacement.** This is the maximum displacement of the spring in mm or inches. This value is calculated automatically depending on spring characteristics.

**Start position.** This is the start position of the spring. This value is calculated automatically depending on spring characteristics

**End position.** This is the end position of the spring. This value is calculated automatically depending on spring characteristics.

**Comments.** The user can enter additional information regarding to the test.

## 1.5.2 On line

This area shows real-time information captured by the unit.

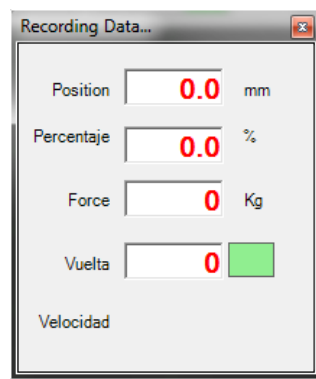
**Position.** The captured position of the spring in mm or inches. The measurement units can be modified in *Options > Configuration*, or clicking in the *Tools* button in the toolbar.

**Percentage.** The percentage captured by the unit.

**Force.** The force captured by the unit in Kg. or pounds. The measurement units can be modified in *Options > Configuration*, or clicking in the *Tools* button in the toolbar.

**Zero.** This button allows the user to calibrate the value of the load cell.

## 1.5.3 Recording data

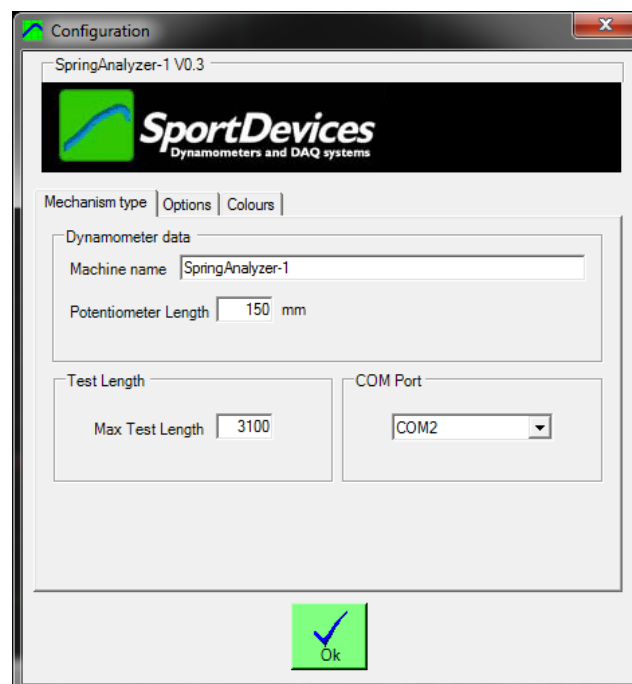


This window will show you real time data related to the spring captured by the unit.

## 1.6 Program Configuration

Configuration is distributed in three tabs:

### 1.6.1 Mechanism Type Tab



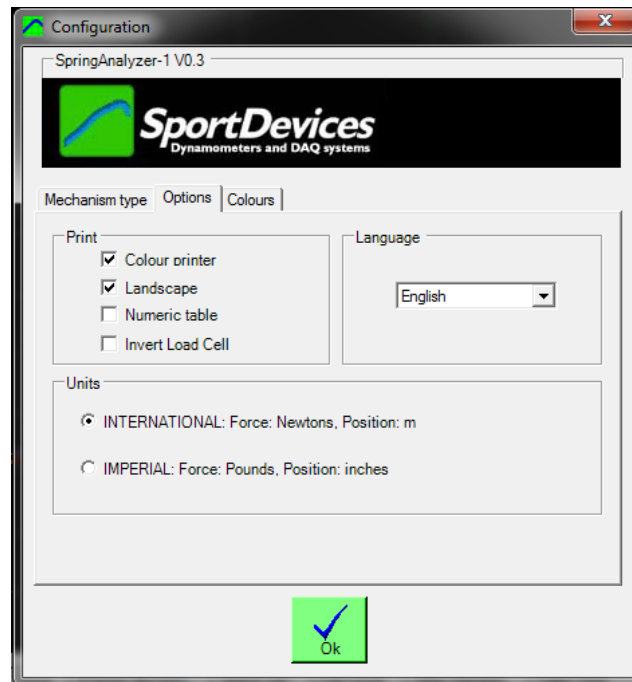
**Machine Name**, name for the reports (print),

**Potentiometer length**,

**Max Test Length**, maximum number of turns of test recording,

**COM Port**. Choose the communications port where the ShockAnalyzer unit is connected.

### 1.6.2 Options Tab



#### Printer Settings:

**Colour Printer**, when printing in a non-colour printer all curves will use the same colour to ease the visual reading.

**Landscape**, portrait / landscape, the curves will be printed vertically or horizontally.

**Numeric table**, a table with the data captured is printed with the graph.

**Invert Load Cell**, the load cell is inverted

**Units**: it allows the user to choose the measurement units between the International System (Newtons and meters) and the Imperial System (pounds and inches).

**Language**: changes the language of the application.



### 1.6.3 Colours Tab

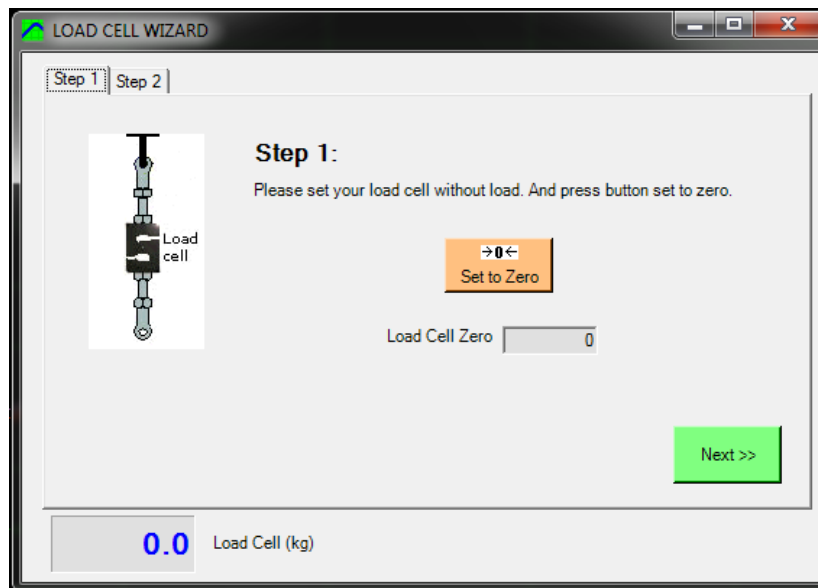


Each channel for each test can have a different colour. The user can edit them on this window. After editing, the **write button** has to be pressed to save the changes.

## 2 LOAD CELL WIZARD

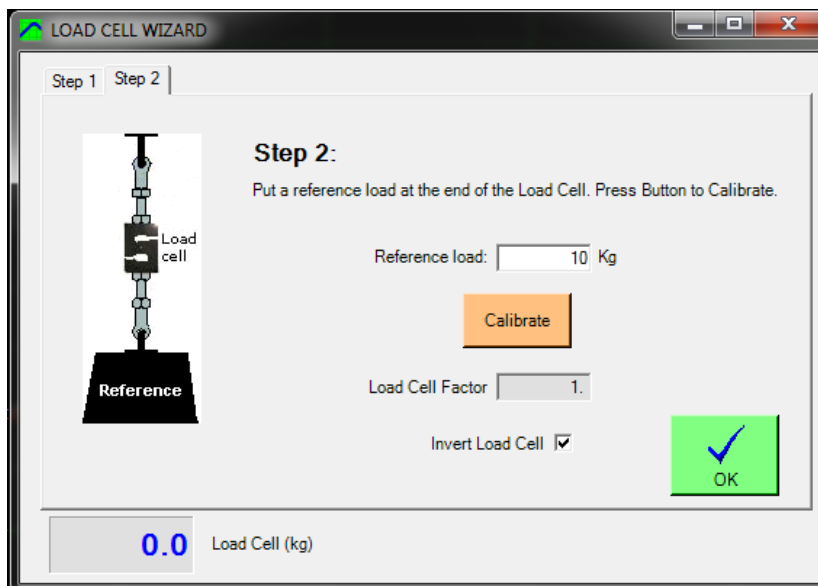
This window eases the Load Cell calibration process. It is divided into two steps:

### 2.1 Load Cell Zero



With the load cell free, press the “set to zero” button and check the “load cell zero” value is between 30000 and 35000, otherwise there may be some problem on the wiring or ShockAnalyzer DAQ.

### 2.2 Load Cell Scale



With the calibration weight pulling the load cell, enter the calibration weight value on the white box and press the “calibrate” button.

The user can also invert the load cell, checking the box.

Check that the load cell reading (blue number, Kg) matches the “reference load” number.

Finally, press **OK** button to finish the calibration process.