

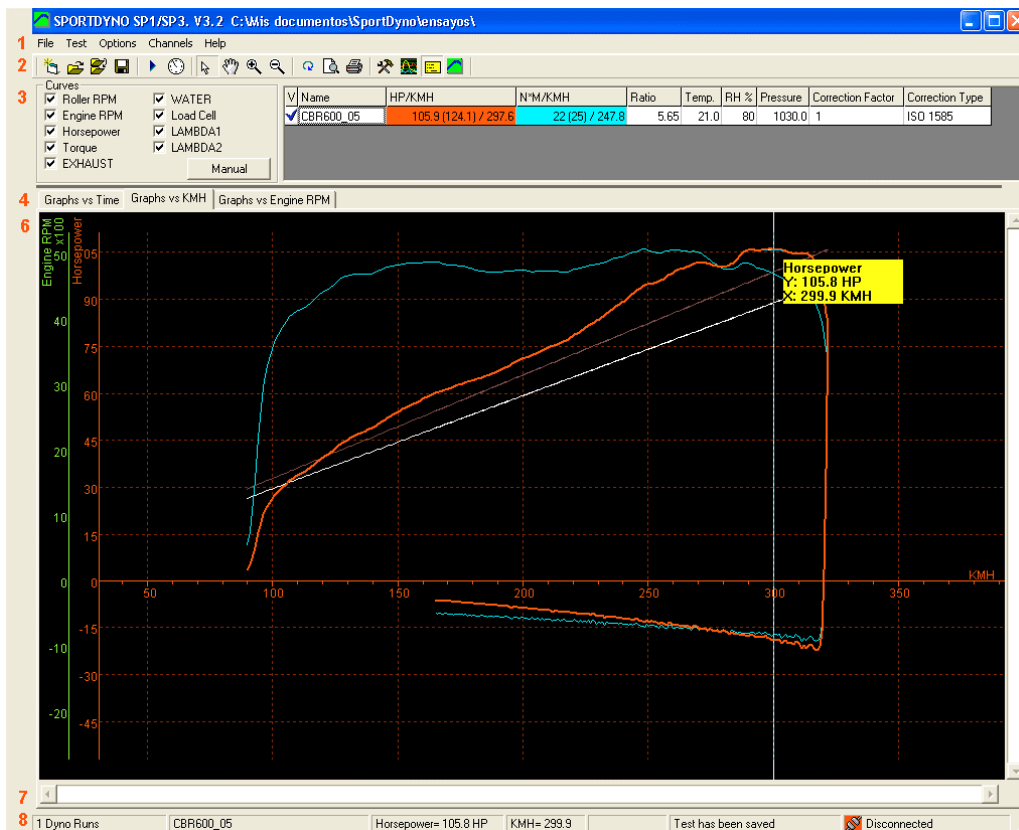
SPORTDYNO V3.2.

USER'S MANUAL

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1. Main screen.
2. How to make a dyno run?
3. Gauges window: user configuration.
4. Ratio window.
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1. MAIN SCREEN.



This screen is divided into several zones that are described below:

1. Menu
2. Button bar.
3. Channel selector.
4. Options for X axis.
5. Tests list.
6. Graphs area.
7. Scroll bars
8. Status bar.

1.1 MAIN MENU

Below are explained the options of the program, there are five menus:

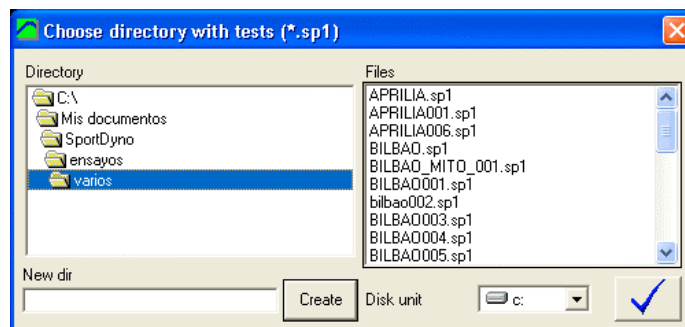
FILE MENU

File	Test	Options	Channels
New Dir			Ctrl+R
Open			Ctrl+O
Change Directory			Ctrl+C
Save			Ctrl+S
Save as...			
Save Picture			
Save Speed Data			
Save HP Data			
Preview			F11
Print			F12
Exit			Ctrl+Q

New. 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).



Change directory window

Save as. It allows saving the dyno run with a different name or in a different place.

Save picture (new). It saves a picture with the current graphs area in BMP format. If you want to send it by email, it is better if you change it to gif later.

Save speed data. Writes a text file with the speed data of the test in ASCII format, so the data can be used with other programs, for example Microsoft Excel.

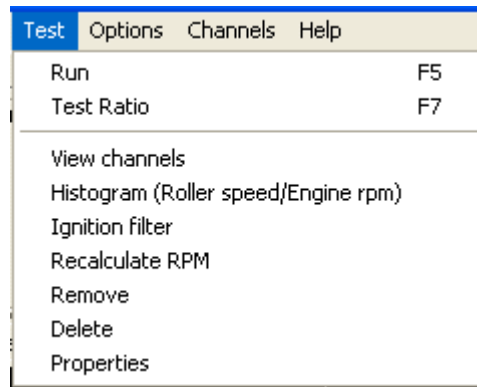
Save HP data. It writes a text file with data from HP and TQ in ASCII format, so data can be used with other program like Excel.

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 you can first choose and configure the printer.

Exit. It exits from the program.

TEST MENU.



Run (F5). It shows the 'gauges' window. In this window you can input the data for the dyno run and environmental conditions. Then, you can start the test by clicking over the 'start' button in this window or the start button at the dyno.

First click will show this window, **second click** will start test, **third click** will finish the test.

Test ratio (F7). This option opens a window that is useful to calculate the RPM/KMH ratio when the engine RPM channel is not available.

In this window you can input the rpm value at which you will do the test.

With last gear, accelerate the engine up to the chosen RPM value (for example 6000) and press continue button (or button in the dyno).

View channels. A new window is displayed with all recorded channels from the selected dyno run. It is also possible to show this window by **right-click** over the test (list), and then view channels.

While in the main screen curves of horsepower, engine torque and rpm from several tests can be seen simultaneously, this screen shows all the channels of a single test: engine rpm, roller rpm, exhaust temp, etc

Histogram: Performs a statistic analysis in which can be seen the predominating RPM/KMH ratio of the test. The program makes automatically a histogram after doing a dyno run when the "using rpm clamp" option has been chosen.

Ignition filter. This option removes some "glitches" at RPM channel, but not always it can be done. Nevertheless, SportDyno software use engine rpm channel in a statistic way to determine ratio between engine RPM and speed of roller, so little glitches at the channel doesn't matter. (Ratio is calculated only when roller accelerates, so rpm channel is not used when the engine decelerates)

Recalculate RPM. This option recalculates all engine RPM channel by overwriting the previous values with its calculated ones. This new values are result of multiply speed channel by Ratio value, thus if ratio value is wrong, resulting RPM channel will be wrong.

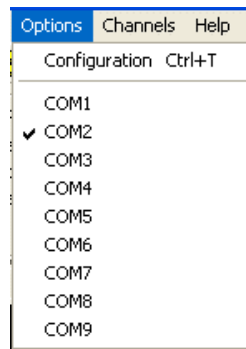
This option is only useful to generate a calculated rpm channel when is wasn't recorded, but keep in mind that this channel is fake, and can not match with the true one...

Remove. It removes the selected dyno run from the memory (not from the disk).

Delete. It deletes the dyno run from the memory **and from the DISK**. Be careful.

Properties. It shows all data from the test in a new window (the same data as in the dyno runs list). This window allows the user to change certain values (such as ratio, temp, etc) after doing a dyno run.

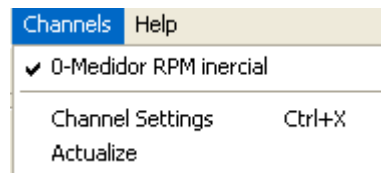
OPTIONS MENU



Configuration. Shows a window with the program configuration, it is explained below.

COM1-COM9. It selects the serial port in which the SPx module is connected. If a port fails, it will appear in grey. If there is not any available port, it is recommended to close all programs and open **SportDyno** again.

CHANNELS MENU.



0- Inertial RPM meter. This is the main channel on the SPx module, it records rotational speed of the roller at a frequency of 50 samples per second. The software calculates Torque and HP of the engine by using this channel. This channel can not be disabled.

1- Engine RPM meter. Basic channel on the SPx module, it records the frequency of the ignition discharges by using a capacitive clamp in the high voltage cable of the spark. All channels run at the 50 samples per second frequency. This channel can be disabled and thus it won't be recorded in the dyno run.

A- Thermocouple 1. Additional channel, it records exhaust temperature by using a thermocouple inserted in the pipe near engine. Temperature range is 0 - 1000 °C

B-H. Thermocouple 2-8. They record temperatures in other engine points: water, oil, etc. Temperature range is 0 - 1000 °C.

I- Load cell. Sensor 1, optional channel, (only at SP3 unit), it measures the torque absorbed by the brake by using a load cell.

J- Sensor 1/Lambda 1. General purpose channel, it is often used with a lambda probe.

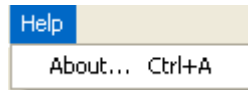
K- Sensor 2/Lambda 2. General purpose channel, it is often used with a lambda probe.

L-Q Sensors 3-8. Rest of optional channels, they are general purpose channels.

Channel Settings. It shows the channels configuration window. Channel name can be changed in this screen so the name matches to the function that channel performs in your dyno, for example: channel J: 'sensor 1', could be named 'lambda 1'. Also, you can modify the scale data of the sensor, and decimal places.

Actualize. It enquires to the SP module for a list of the channels which are available on it, and then they are enabled in this menu. It is used if you first start the software and then the SP module, because in this case the software does not know which channels are available. By default only 0 (inertial RPM meter) channel is enabled.

HELP MENU



About. It shows information about SportDevices, developer of the software and SP module manufacturer.

1.2 BUTTON BAR



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

New. File/new menu.

Open. File/open menu.

Change directory. File/change directory menu.

Save as. It saves the dyno run with another name or in another directory.

Run. Test/run menu. (F5 key)

Test Ratio. Test/ratio calculation menu.

Arrow (new). Normal mode, it lets the user to select a test or a channel directly over the graphs area.

Move (new). It lets the user to move the graphs with the mouse, it is useful when using zoom.

Zoom + (new). It magnifies the graphs area x 2.

Zoom - (new). It reduces the graphs area / 2.

Redraw. Draws again the dyno runs, and also calculates again the scales (if not in manual mode)

Preview. File/preview menu (F11 key)

Print. File/print menu (F12 key)

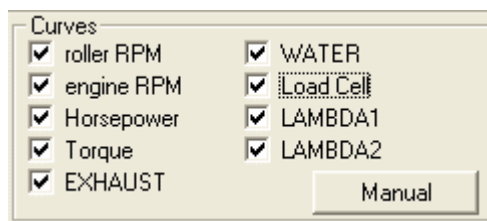
Tools. It opens program configuration window.

Channels. It opens channel configuration window.

Label. It shows/Hides data label. This label shows certain information from the chosen channel while the user moves the cursor across the tests.

About. Help/about menu.

1.3 Channel selector.



There are several channels at this box, if checked this channels will appear on graphs area (if they exists at the dyno run):

- Roller RPM.** It displays roller rpm channel (when selected)
- Engine RPM.** It displays engine RPM channel.
- HorsePower.** It displays horsepower channel.
- Torque.** It displays torque channel.
- EXHAUST.** It displays thermocouple 1 channel (if available).
- WATER.** It displays thermocouple 2 channel (if available).
- Load cell.** It displays load cell channel (torque from brake in SP3).
- Lambda1.** It displays lambda channel 1 (if available).
- Lambda2.** It displays lambda channel 2 (if available).

1.4 OPTIONS FOR X AXIS.



Options in this box are:

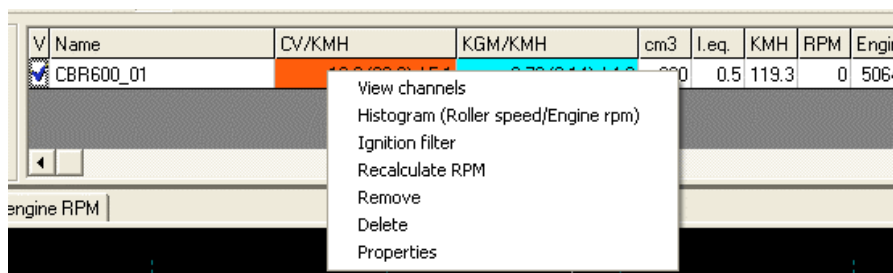
- “**Graphs vs. time**” It displays dyno run curves as a function of time (seconds).
- “**Graphs vs. KMH/MPH**” (for vehicle dynos) or “**Graphs vs. Roller RPM**” (for engine dyno) It displays dyno run graphs as a function of roller RPM/Speed
- “**Graphs vs. Engine RPM**” It displays test curves as a function of engine RPM. This channel is always calculated by using the ratio value (RPM/KMH) of dyno run, so this scale will be wrong if ratio is wrong.
Automatic engines can not be displayed in this mode, because its gearbox ratio changes while the roller accelerates.

1.5 DYNO RUN LIST

V	Name	HP/KMH	N°M/KMH	Average HP / time	KMH	Ratio	Temp.	RH %	Pressure	Corrector	Correction Type
<input checked="" type="checkbox"/>	APRILIA001	11.7 (14.6) / 22.16	41 (51) / 21.98	3.9/4.9	143.6	0.0	25	50	1000	1	

This list contains tests loaded from the disk or tests done with the dyno.

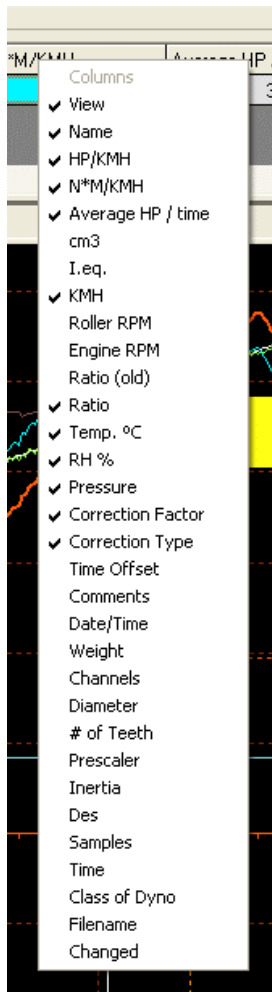
By **right-clicking** over the test list, a popup window will be displayed to ease certain functions related with the test. Behaviour of these functions is the same as on the Test Menu.



(New) From this version the user can change directly most data over the list, to do this you can press key F2 or click twice over the desired cell. Note: **grey cells** can not be edited.

(New) If you right-click over the Titles row then a popup menu will be displayed. This menu contains all **columns available**. Here you can check / uncheck over them in order the columns will be displayed on the list or not.

Columns:



View. By clicking over this column a “check” mark will appear/disappear, making the test being displayed / hidden on the window.

Name. Name of dyno run, if name is changed and then ENTER is pressed the file on the disk will change its name too.

HP and TQ. These are the maximum values of power and torque, and RPM or KMH or MPH at which values was done (depending on the configuration)

If HP at engine is selected (on configuration window) it will be displayed in this way:

HP=90 (105) / 9000:

90 HP at wheel, (without losses),

105 HP at engine, (with losses), read at 9000 rpm

TQ=50 (65) / 7000:

50 N*m torque (without losses),

65 N*m torque (with losses), read at 7000 rpm

Average HP. If average option used (starting rpm and ending rpm have value) the program will show the average HP value in the selected area.

For example, if an engine has 50 HP at 5000 rpm, and 60 HP at 6000 rpm (making a straight line), the average power will be 55 HP between 5000 and 6000 rpm.

Cm3 (displacement). This field is used in “displacement correction” option (roller inertia + rolling parts of the vehicle). It can be changed after the dyno run is done (key F2 or double click)

I.eq. (equivalent inertia). This value is added to the inertia of roller when “displacement correction” option is checked).

There is a file: “**inertia.ini**” that stores all displacement and inertia values used in this option. The user can modify this file.

It can be edited.

KMH. Maximum speed of roller during the test. It can be changed to MPH in configuration window.

Roller RPM. Maximum roller speed during the test in RPM.

Engine RPM. Maximum engine speed during the test in RPM. It may be wrong if some spikes has been read from the ignition.

Ratio (RPM/KMH) (old). This field is used in the program to draw the horsepower vs. engine RPM. Its only recommended for vehicles with manual gearbox. The formula is: “engine rpm / km/h”, i.e.: if vehicle with the last gear set is running at 200 km/h and its engine is at 12000 RPM, it will have a ratio of 60.

Also, ratio value can be calculated if ratio between gears and wheel are known. Usually ratio value is calculated by the program automatically, when ignition pickup is used. The program does a histogram from engine rpm/speed values and takes the most important value for the ratio.

Ratio (new). In previous versions, the ratio formula was different for engine dynos and vehicle dynos, and this can confuse the users. Now the ratio formula is always “engine rpm / roller rpm”, but the old value is maintained for compatibility.

Ratio button, when you edit the ratio value, this button is shown. By pressing it automatically does a histogram between “engine rpm / roller rpm” and it puts the calculated ratio into the ratio box (new). It can be used if was input a fixed value when doing the dyno run, but you are not sure about the value is right.

Temperature, humidity, pressure. Weather conditions are stored with the dyno run when is done. They are important because “temperature correction” option uses them. If changed after doing test, HP and TQ values will change too.

Correction factor (new). Depending on the chosen correction type, the program will calculate automatically this value. This value can be edited, and once you have changed it, the program won't recalculate it again. But if you want the program recalculates it, you only have to delete the number and press enter, then the program will calculate it again as a function of temperature, humidity, air pressure and correction type.

Correction Type (new). There are several correction formulas available:

- Blank (none)
- ISO 1585
- SAE J1349
- DIN 70020
- JIS D1001

The program will use the correction type of the configuration window as default, but you can change it after the test is done

Time offset (new). This value has been added to the dyno run to enable comparison between tests when graphs are displayed vs. time, because the starting point of each test is not always the same. By changing this value all the test will be displaced later in time (positive values) or displaced before in time (negative values)

Comments. Comments are stored with the test. If editing the comment there will be displayed a button at the right of the box of the comment (...). By clicking the button it will show a window in which comments can be written in several lines.

Date / Time when the test was done.

Weight of vehicle. At the moment this field is only informative, but will be used for acceleration calculation purposes.

Channels recorded in the test. For example: 01AJ: 0-roller, 1-engine RPM, A-thermocouple, J-lambda.

Diameter of the roller used to do the test. The program uses it when calculating HP and TQ. It can not be edited.

Number of teeth used to do the test. The program doesn't use it once the test is saved. It can not be edited.

Prescaler used on the test. The program doesn't use it once the test is saved. It can not be edited.

Inertia of the roller / flywheel. The program uses it when calculating HP and TQ. It can be edited if you have input it wrong.

Samples taken by the SP1 / SP3 for the main channel. Future versions will have channels at different speeds.

Time spent on the dyno run. This **value has no relationship with the acceleration of the engine**. You can do a test of 5 seconds and then wait 30 seconds before stop the test, and then the test will be 35 seconds long.

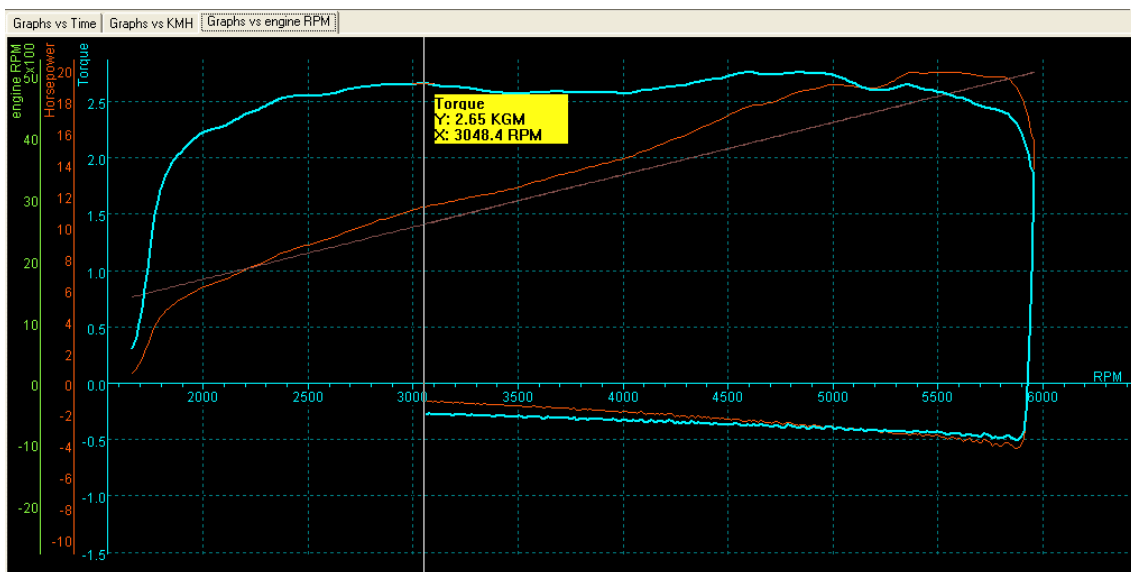
Class of dyno where the test was done (vehicle or engine).

Filename. Full file name and path of the test.

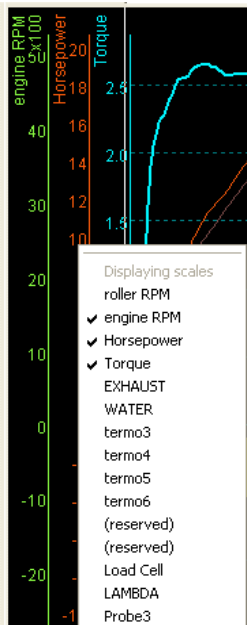
Changed. It will be "*" if the test was changed. If using "automatic saving" the test will be saved and this filed will be blank again.

1.6 GRAPHS AREA

In this area are shown the curves from the channels of the different tests loaded in memory (power, torque and rpm).



At the left side of the curves, are shown the scales:



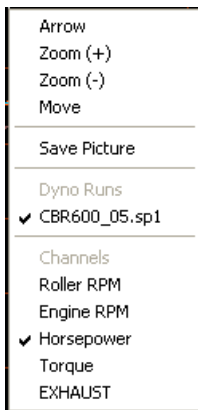
Engine rpm (**green**)
Horsepower (**red**)
Torque (**blue**).

X axis at the bottom shows the selected scale (time, roller RPM, km/h or engine RPM)

The scale from the **selected channel** (torque at the example) is displayed to the left side, close the curves area. All drawing lines of the area are drawn using the same colour.

To show/hide any test only it is needed to click over the first column on the list of tests at the desired test.

By **right-clicking** over the **scale area**, it is shown the scale channel menu. In this menu can be chosen which channels will be displayed at scales. But only will be shown scales from enabled channels (on channel selector)



By **right-clicking** over the **graphs area**, it is shown a list with the loaded tests (and the selected one) and a list of the channels included in the current test (and the selected one)

You can change the selected Picture test or the selected channel in this lists.

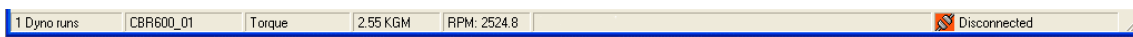
Arrow, zoom +, zoom -, and move options have been added here to ease access. They work equal as button bar.

Also, **save picture** option has been added. The same as on file menu.

1.7 SCROLL BARS

When zoom is used, the user can change the graph position by using the “move” option or by using the scroll bars (at bottom and right side of the window).

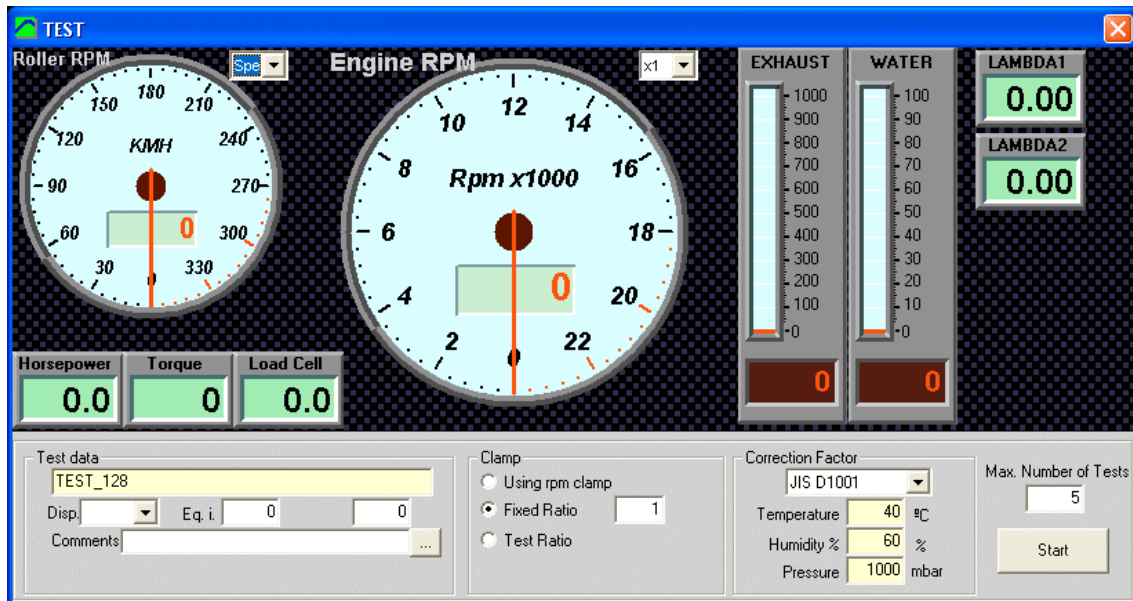
1.8 STATUS BAR



This area shows:

- number of tests loaded in memory,
- name of selected test
- name of selected channel,
- values from selected channel, while the mouse moves over the graphs area,
- status messages,
- SP module is connected or not.

2. HOW TO MAKE A DYNO RUN?



There are two ways to make a dyno run:

WAY 1:

By pressing F5 key, the software will show the 'gauges' window. This window shows in real time the roller speed in rpm and km/h or mph, in addition if other sensors are connected, engine rpm and temperatures are also shown.

This window is used to input the data of dyno run:

- **Name of test**, this name will be the same that it will be saved to disk,
- **Engine displacement**, at vehicle dynos, the program will calculate an equivalent inertia to correct the power (if compensation is enabled at main screen),
- **Weight**, is an informative value, it is not used on calculations.
- **Weather conditions**: air temperature, humidity and pressure. These values are used to correct horsepower and torque. **(New)** here you can change the **correction factor** used for this test. By default it will be the same as on configuration window.
- **Ratio mode**: you can do dyno runs by using the ignition pickup or by using a fixed value (a known value, or a calculated value with the "ratio" window). **(New)** In this version **ratio calculation** has been upgraded so it is being calculated **while the dyno run is being done** (if rpm clamp is used) in order to get the actual rpm readings while doing the test.

(New) Max number of tests, (in older versions: "remove last tests"), this box (at the bottom-right side), indicates to the program the maximum number of dyno runs loaded at memory each time a new dyno run is done, it will remove the older ones if there are more. It is useful when a lot of test are going to be done, for example to allow one alone person to use the dyno. It prevents to accumulate a big quantity of curves at screen.

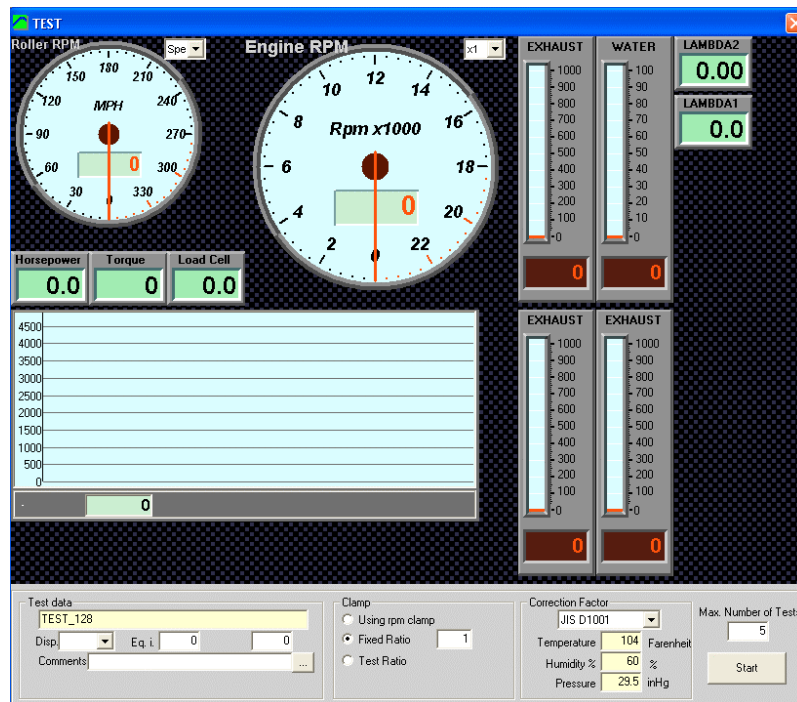
Once you have filled data of the vehicle / engine, the dyno run can be started pressing again F5 key or the switch on the dyno.

WAY 2:

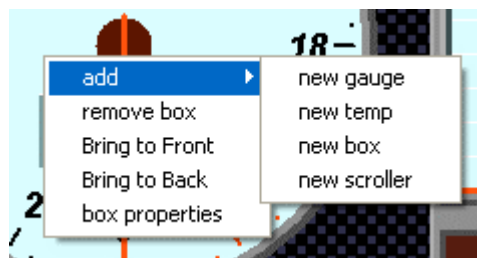
If using the switch on the dynamometer, the behaviour of software will be the same. Two clicks will be needed to make a dyno run.

The name will be assigned to the test will the previous modifying the last three digits of the name and adding one. For example, if last test was called BIKE, next will be named BIKE001, and the next BIKE002, and so on.

3. GAUGES WINDOW: User configuration.

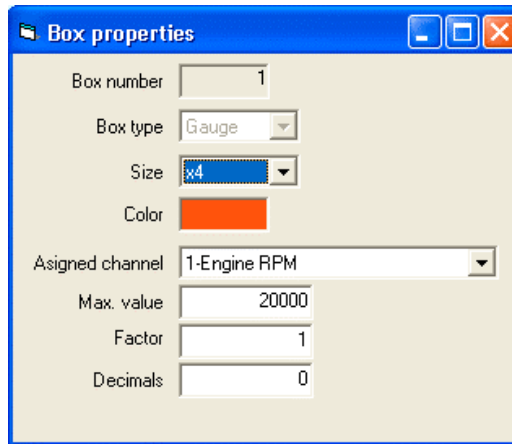


(New) This window is now user configurable. The user can add new controls: gauges, thermometers, numeric boxes or scroller type windows. If you right click over any control a popup menu will appear.



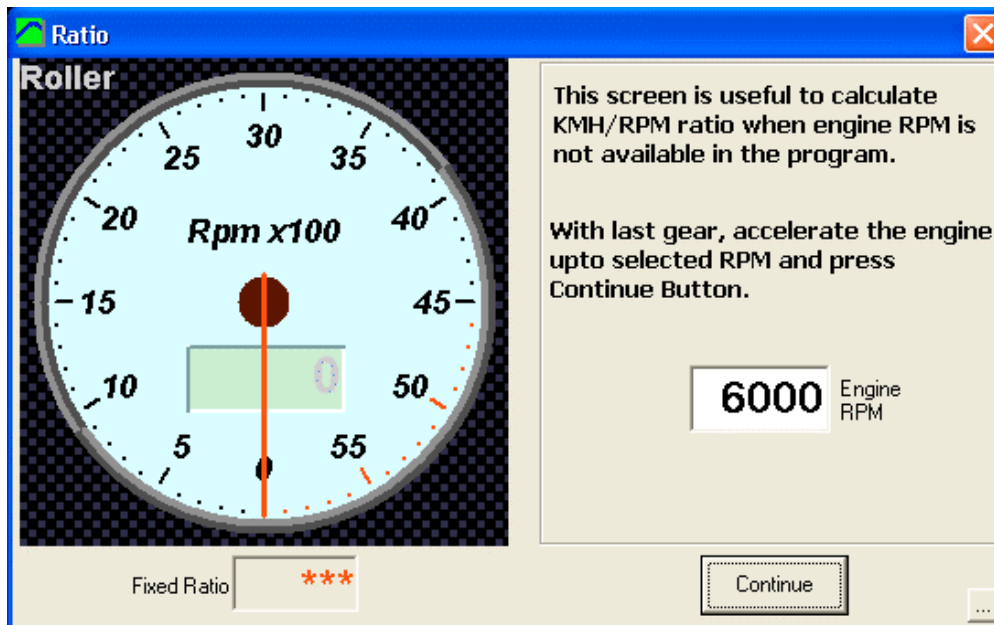
Options are:

- **Add new control:** gauge, temp, box, scroller. Once the control is on the screen, you can move it to the desired position, and to change its properties and assigned channel.
- **Remove box:** you can remove any of the current controls on the screen.
- **Bring to Front:** you can move a control over all others on the screen.
- **Bring to Back:** you can move a control over all others on the screen.
- **Box properties:** with this option a properties window will be shown. This window lets you to change certain data from the control.



In this window you can change the size of the control (gauge and scroller only), the colour used for numbers, the assigned channel, and maximum value, factor (scale) and decimals (from channel configuration).

4. RATIO WINDOW



By pressing F7 key from main window or by selecting **Test Ratio** option at “gauges” window, the program shows this window to start a process to determine the ratio value on a given vehicle.

When ratio value is unknown for a vehicle and ignition channel is difficult to record (for example diesel engines) or it is noisy and inaccurate, it is better to approximate ratio value with this method.

The procedure consists on fixing a certain rpm value on this window (for example 6000 rpm) and drive the engine to the same value with the last gear set.

At this moment, the roller will run at a certain speed (for example 2000 rpm), and ratio value will be = **fixed rpm / roller rpm** (6000/2000 = 3 on the example). For example, when pressing “continue” or dyno button, this value will be used after this process on the next dyno run.

5. CONFIGURATION

From the main menu (options/configuration) this window can be shown:
There are three sections (tabs):

TAB 1: DYNAMOMETER CONFIGURATION

The screenshot shows the 'SPORT DYNO SP-1 V3.2' configuration window. The title bar includes the text 'SPORT DYNO SP-1 V3.2' and a close button. The window features the 'SportDevices' logo and website address 'www.SportDevices.com'. Below the logo is a tabbed interface with four tabs: 'Class of Dyno', 'Program', 'Options', and 'Colours'. The 'Class of Dyno' tab is active and contains the following fields and controls:

- Dyno Name:** A text box containing 'SD325' with '+' and '-' buttons for adding or removing configurations.
- ROLLER Characteristics:** Two input fields: 'Diameter' set to '325 mm.' and 'Inertia' set to '4.6'.
- Class of Dyno:** Radio buttons for 'Engine' and 'Vehicles' (selected), and a checked checkbox for 'Load Cell'.
- Torque Calculation:** Radio buttons for 'Torque at Engine' (selected) and 'Torque at Roller'.
- SP1/SP3 Configuration (V2):** Input fields for '# of Teeth' (110) and 'Prescaler' (16), and a 'Program' button.

At the bottom of the window are two buttons: 'Reset ALL' (with a red 'X' icon) and 'Ok' (with a blue checkmark icon).

Dynamometer name: This box allows you to input the name of your dynamometer. It also enables to use several configurations with the same program and electronic unit.

There are two buttons: '+' and '-' order to add a new configuration to the list, and to remove the actual one.

Roller characteristics: diameter and inertia. This data are fixed for each dyno and it is not recommended to be changed (from the actual value for each dynamometer), since they will affect directly to speed and horsepower measurements.

Type of dynamometer, you can choose between vehicle dyno and engine dyno. Vehicle dyno may use “displacement correction”. Also, losses on transmission are calculated.

In addition of this, vehicle dynos uses the formula “engine rpm / km/h” to calculate, while engine dynos uses “engine rpm / roller rpm”.

Load Cell. When available (on brake based dynos), this option adds torque value from the **load cell** channel reserved to the torque due to inertia to get the whole torque of the dyno run. An ideal brake dyno system will have low inertia (then low inertial torque) and great torque from the brake (measured with load cell). It is recommended that this checkbox is always set.

Torque calculation, by default torque calculation mode is “torque at engine”. The program calculates this value from the torque measured at roller, and uses the ratio value to do this. You have to keep in mind that torque at engine will depend on the ratio value. If you fill a wrong ratio value for the dyno run, torque at engine will be wrong too.

Torque at engine uses to be lower than torque at wheel due to gearbox, because it increases torque as decreases rpm.

Device configuration:

FIRST OF ALL: we recommend to use a gear of 110 teeth, and prescaler=16.

Number of teeth: number of teeth at gear used on roller or flywheel. This gear is often used for the starter motor too.

Prescaler: this feature is not changed usually; its default value is 16. It is intended to adapt the digital input to the different number of teeth. SP1 unit can measure from 0Hz to 15.000Hz, depending on prescaler.

Depending on the number of teeth, gear tooth will generate a different frequency at the pickup, and then you should choose a different prescaler.

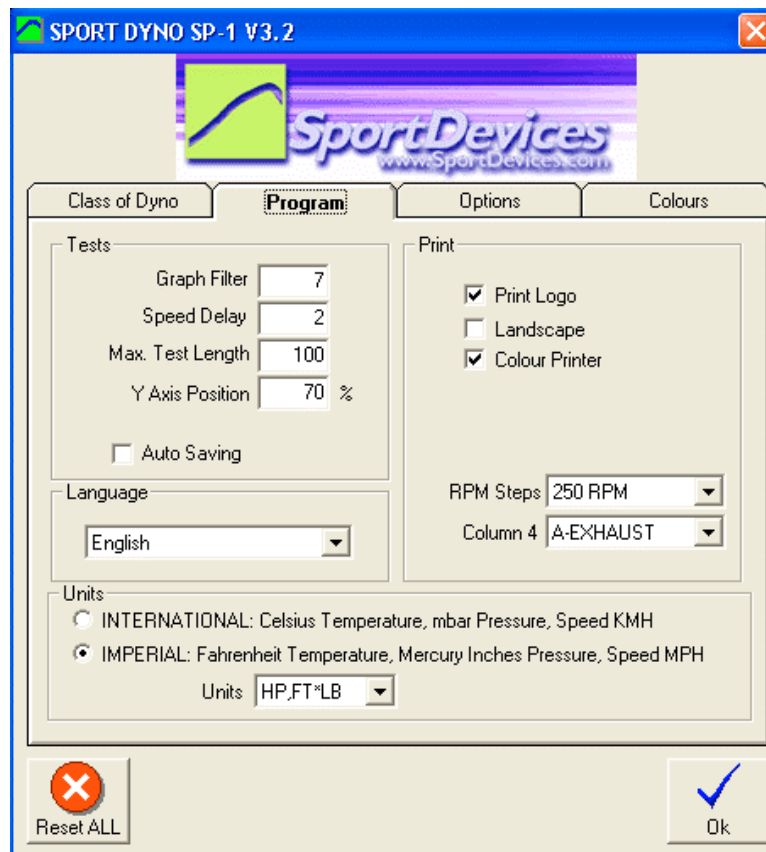
Configuration	Minimum teeth	Maximum teeth	Frequency range
PRESCALE 1	1 teeth (60.000 RPM)	8 teeth (7.500 RPM)	0 to 1000 Hz
PRESCALE 4	2 teeth (120.000 RPM)	60 teeth (4000 RPM)	0 to 4000 Hz
PRESCALE 16	61 teeth (14.754 RPM)	160 teeth (5.625 RPM)	0 to 15000 Hz

Note: multiplier is an **old** feature used for test high rpm rollers (>16000 rpm), but it has been removed from version 3.0, because data transmission was improved, and now it is no longer needed.

RESET ALL (button). This option will erase all stored configuration from the program. If you have changed something on the program and you don't remember what and the program works in a different way then before, and you are not able to make the program to work as before, you can use this option.

If you are using older versions (2.8 and older) and you are experiencing some trouble due to the presence on the computer of a newer version, you can use this option to blank all configuration data in order to run again the old version.

CONFIGURATION. PROGRAM OPTIONS.



TESTS:

Graph filter: Software performs filtering on horsepower and torque curves, this value can be between 10 and 20 on old SP1 units (version 2), and can be from 0-15 on new devices. Lower values will show bad curves full of spikes, and higher values of filter will smoothed the curves too much, and the little details from engine will be loosen.

Speed delay: This value is usually set to 2. It is only modified when using SP3 with load cell to match the delay of load cell; typical values are 6 or 7 (for load cell).

Max. Length: maximum time for data recording, default value is 100 seconds.

Y axis position: percentage of area used for the positive part of the curves. If you are using an engine dyno without clutch you may find interesting to use 90 or 95% of the graph for positive area (because you won't record losses at negative area), but if you are using a vehicle dyno, it could be better if using 70% or lower area. Default value is 70%.

Auto saving (new): By default the program always save the dyno runs to the disk when a test is done. But if you want, you can disable this option. Later, the program will ask you if you want to save it to the disk, when you close the program or the test.

LANGUAGE:

Language: at the present there are available five languages in the software: **English, Dutch, French, Spanish and German.** These languages are stored on text files (*.lan) that can be changed by the user easily (with Notepad for example). When language is changed, the changes will take effect when closing the configuration window.

PRINTER OPTIONS:

Print logo: you can select whether you want print logo at paper or not. There is a file named "**logo.gif**" that can be replaced to set your own business logo.

Landscape: With this option dyno runs will be printed vertically instead of horizontally. In this way a bit less data will fit on the paper.

Colour printer: if not checked, printing will be optimized for black and white printers; else, graphs are printed with the same colours as on screen.

RPM step, when printing a dyno run the default RPM step is 250 for the data table, you can change this value to 250, 500 or 1000 rpm.

Column 4, when printing a dyno run, the first three columns of data are: rpm (or time) HP, TQ. The next column can be chosen from the rest of recorded channels of dyno run.

UNITS:

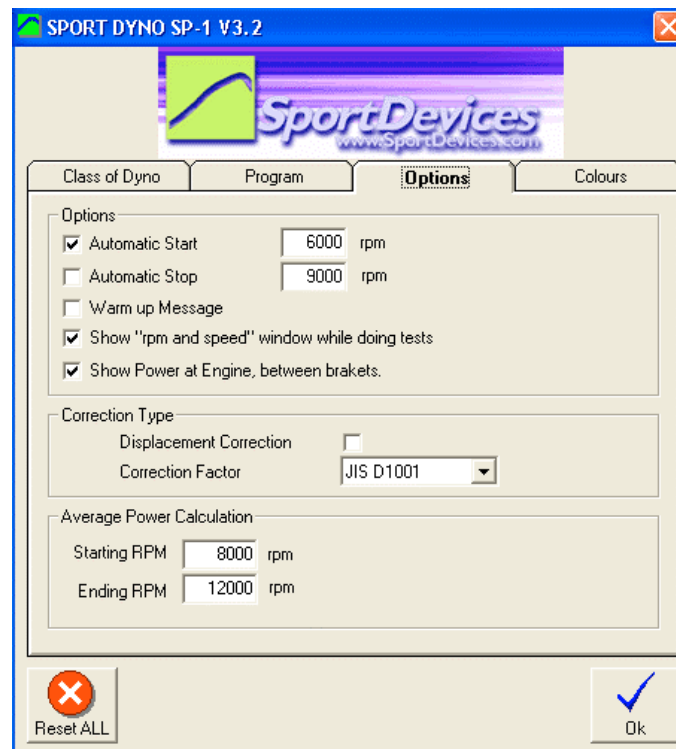
You can choose between:

- "**International units**": KMH for speed, Celsius for temperature, mbar for pressure,
- "**Imperial units**": MPH for speed, Fahrenheit for temperature and inHg for pressure.

Power units. You can choose between several type of units for HP and TQ, regardless International/Imperial setting

- CV (European horsepower 1CV= 0.745Kw) for power, KGM (kilograms per meter) for torque.
- KW (kilowatts) for horsepower, N*M (Newton per meter) for torque.
- HP (horsepower 1HP=0.736Kw), FT*LB (feet * pound) for torque.
- HP (horsepower 1HP=0.736Kw), N*M (Newton per meter) for torque.

CONFIGURATION. OPTIONS:



Automatic start. If this option is selected, the dyno run will start when engine rpm is greater than the value set at the right (6000 rpm)

Mode of operation: when button is pressed, "gauges" window will appear as usually. If you press again the button a second frame will appear (with automatic start activated). This frame tells you "accelerate to max rpm".

If engine rpm is higher than the starting rpm value the "semaphore box" will be red, and dyno run won't start. When engine downs to a lower rpm, the "semaphore box" will be green. Then, when you give full throttle and RPM are higher than the starting rpm value, dyno run will begin.

Automatic stop. When doing a dyno run, you will accelerate the engine close the maximum rpm, then clutch is pressed to leave the roller to decelerate slowly, and when roller speed is lower than the "ending rpm" value (applying ratio) the test will stop automatically.

"Warm Up" message: If activated, a "warm up" message will appear when pressing the start/stop button on the dyno (or F5 on the computer)

Show "rpm and speed" while doing tests (new). This option enables you to hide the two gauges window that is shown while doing a test.

Show "power at engine" between brackets (new). If checked the program will show the power value and power + losses between brackets. The same is applied to torque.

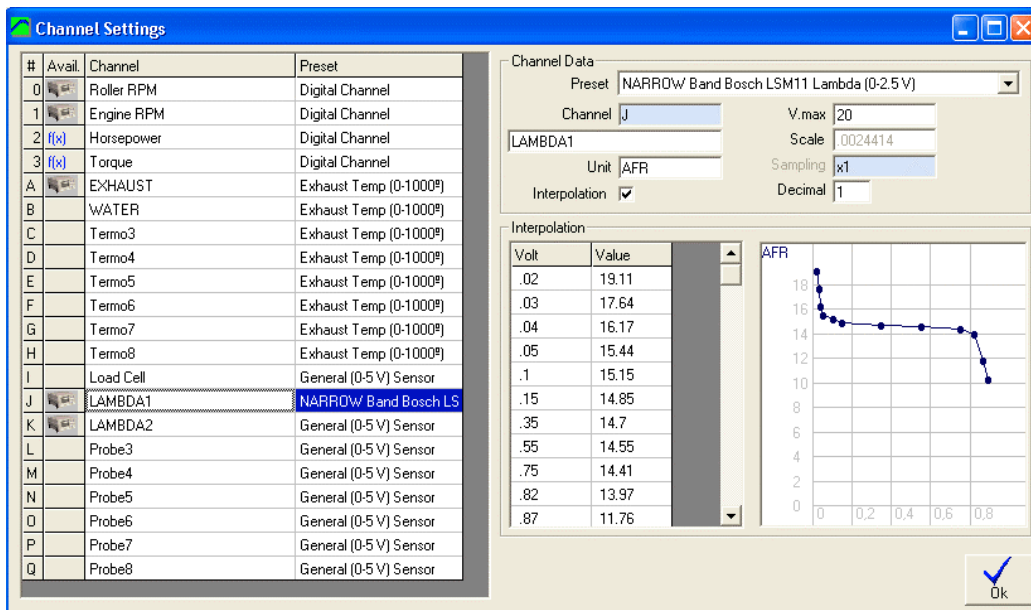
Example: $HP = 55.4 (67.9) / 9000$

In this tab, you can modify the colours that will be used at graphs for each channel.

To modify a colour, double-click over it and then a colour selection window will appear. Select a colour and press OK button.

You can also change the background colour for the main window.

6. CHANNEL SETTINGS (new)



This window is used to display and modify channel settings.

A list of all existing channels is shown at the left side. The box icon means that this channel is available on your hardware. The standard configuration includes: roller rpm, engine rpm, exhaust and lambda1. SP3 units will include load cell channel.

Note: f(x) channels are internal calculated channels (HP and TQ), they are not stored on the disk, and can not be modified.

When clicking over a channel, its data is shown at the right side area:

Preset (new): A list of common input types is available, in this way to configure a common sensor you only have to click over its description:

- Digital Channel, channels from 0-9 are digital and can not be changed,
- General (0-5 V) Sensor, standard input on SP1,
- General (0-2.5 V) sensor, modified input on SP1 (one resistor has to be removed),
- Exhaust Temp (0-1000°), thermocouple input,
- Water Temp (0-120°), the same as before but for water,
- WIDE Band Lambda (0-5V) (9-19AFR), this entry will configure our wideband lambda,
- NARROW Band Bosch LSM11 Lambda (0-2.5 V), pre-configured lambda table.

These presets are stored in the file "ch_presets.ini", this file will be updated in future.

Note: changing the channel preset from 0-5 v to 0-2.5 v doesn't change the input type of the channel, it can only done by opening the SP1 / SP3 and removing (or adding) the 10 K resistor.

Channel key: Internal code to identify the channel. It can not be changed.

Channel Name: Visible name for the channel.

Unit: Measuring unit for the channel (kgs, degrees, rpm, newtons, etc)

Maximum value: maximum value for the channel, it is used as filter on the input. Be careful because if your input is sometimes higher than this value, the program will cut the channel at this value and you won't see the actual reading.

Scale: scaling factor applied to digital input from the SP1. As data received from SP1 is 16 bits integer, data should be translated to its true value on each channel. This is done by using this factor.

For example: general purpose input goes from 0 to 5 volt, and its read values can be between 0 and 1023, then a factor of $5/1023=0.00488$ should be applied so when received 1023 value, it will recorded as 5 volt.

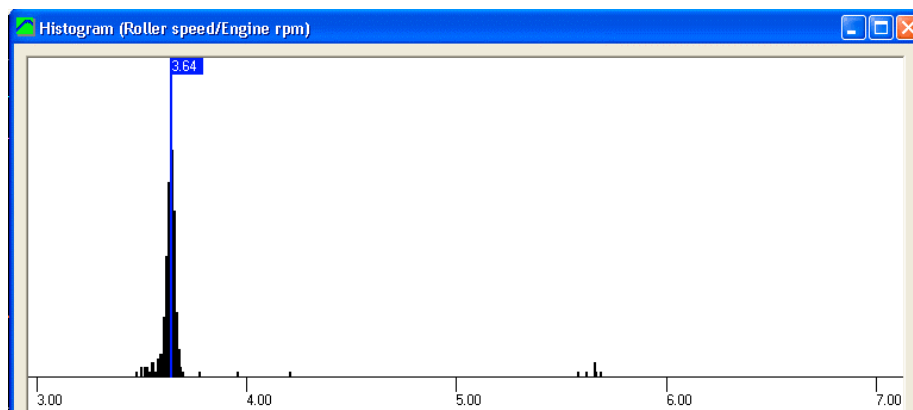
Decimal: decimal places to print the numbers for this channel.

Sampling: sampling frequency of the channel. Not available yet.

Interpolation (new): If checked the program will use the interpolation table instead of the scale value.

In this table you can configure any analog sensor even not lineal ones. Voltage values should be ordered from lower to higher. For each voltage it will be assigned a translated value, AFR (air fuel ratio) in the example.

7. HISTOGRAM



Alter doing a dyno run (with "using rpm clamp" option activated) the program will calculate automatically the ratio value by making a histogram of the "engine rpm / roller rpm" function.

If you want to see the histogram you can select it on the test menu, or by right-clicking over the test you want to see the histogram.

In this window is shown all values from 0 to 25 for ratio, and the magnitude or number of times this value was present when calculating the ratio function for each test sample. Finally the most repeated ratio value is shown with a label (3.64 in the example).