Analisi Termo-Fluidodinamica Motori Racing
Progettazione e Sviluppo – Software Motoristici

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Installation

- *extract the installation file INST-XXXXX.exe from the zip;*
- *to do double click on file INST-XXXXX.exe;*

if function of your windows version you must proceed like this:
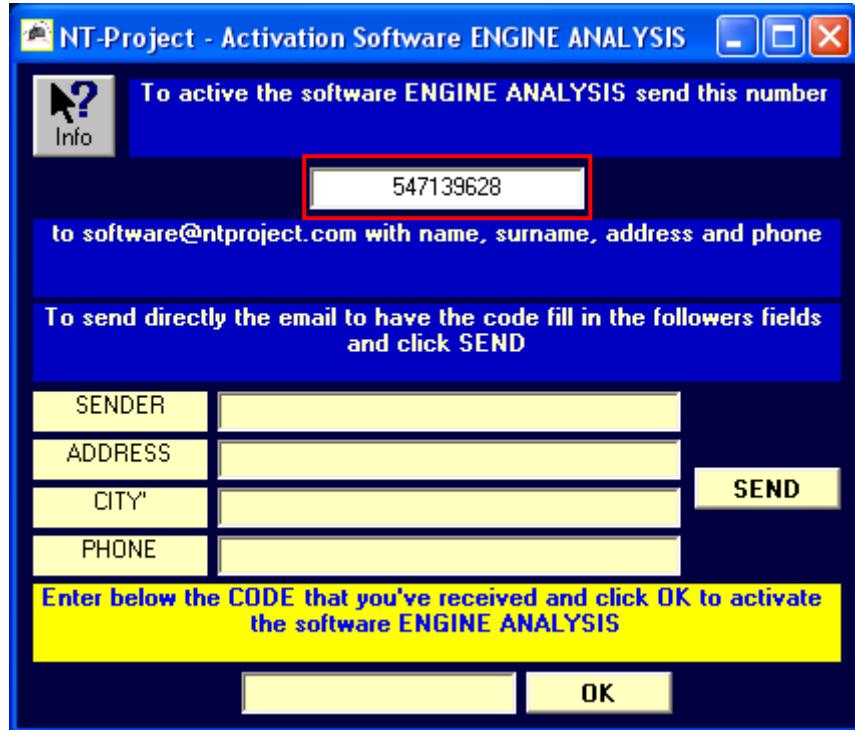
- *click before "More info"*
- *then on "Run anyway";*

or

- *in the message "unknown publisher", "potentially harm", etc. click "Yes";*
- *to follow the indications of installation procedure.*

Registration
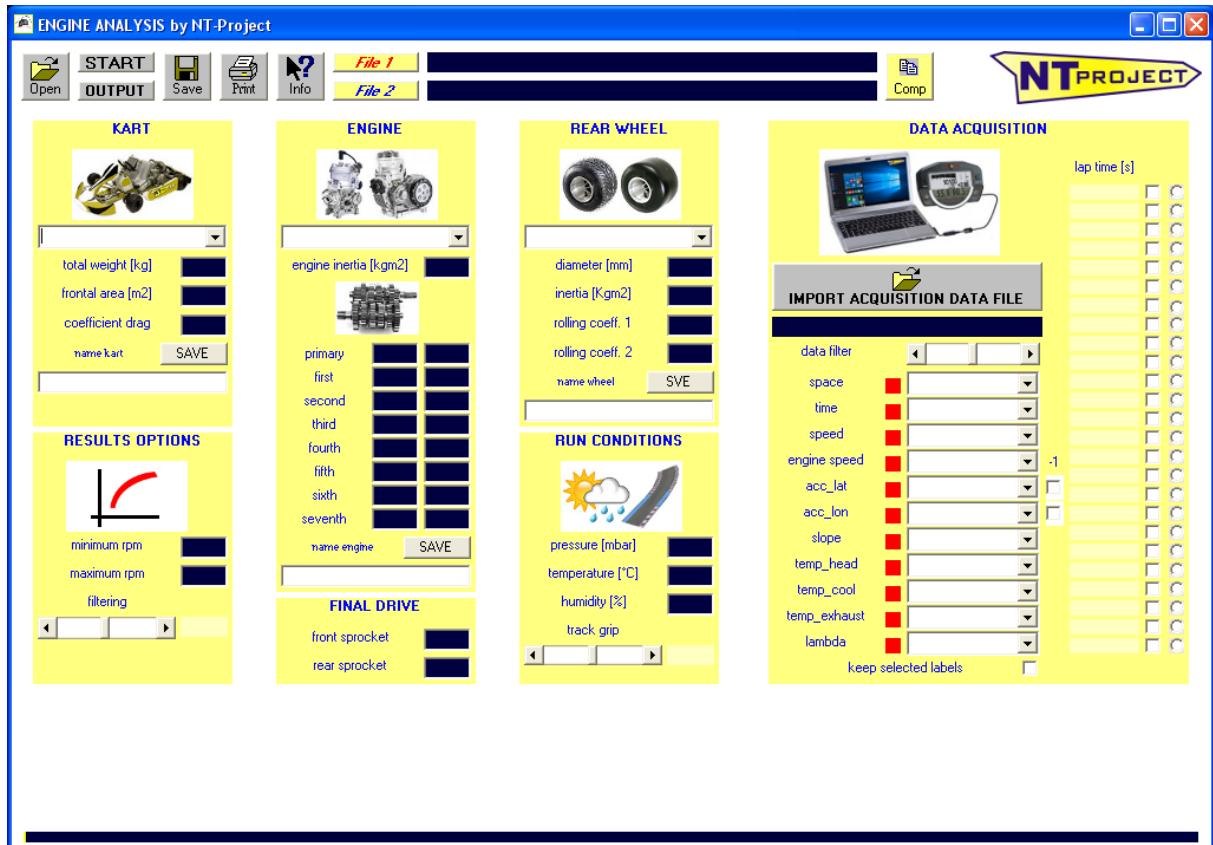
- *to can use the software ENGINE ANALYSIS is necessary to ask the activation code at the supplier;*
- *at the first start of the software to appears this window:*

- *you must fill in all the fields and clicking ok to send directly an email to software@ntproject.com If in your computer the email isn't configured, you can send an email from an other device, providing your personal data (name, surname, address, phone) and the N°PC that appears in the square red (if you don't have the email send a fax 0039-0532-977713);*

- *when you have the activation code, you must enter it in the last field of the window and to click <<OK>> button on the right. At this point the software is correctly registred and running.*

Help

When opening the software appears this screenshot:

data entry
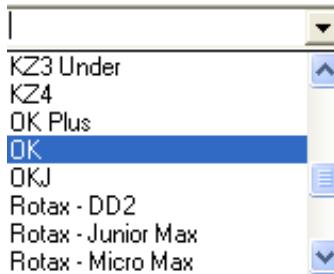
INPUT

To work the software needs the informations about:

KART
ENGINE
FINAL DRIVE
REAR WHEEL
DATA ACQUISITION

KART

You can select directly the category of kart

Automatically the software enter the data more usuals for this category, anyway if there isn't the category, or you want modify some data you can enter manually these data

- total weight [kg] → the value refers to the weight of the kart complete of all with engine mounted (with water, oil, and gasoline), and the driver;
- frontal area [mm2] → you can use the default value of 0.5784;
- coefficient drag → you can use the default value of 0.804;

If you enter a new category, or you modify the data of a category the software gives you the opportunity to save the new data in the list, so you can recover them easily. You must simply enter a new name in the white box below the data, and click the button SAVE.

ENGINE

In the software there are already the inertia and the gearbox data of the main kart engines.

Anyway also in this case if your engine there isn't is possible to save the new data in the list, entering the name of the new engine and clicking SAVE

Is necessary to enter the gears of the transmission primary, and of the gearbox, for your engine. If there isn't the gearbox, you can leave empty the fields.

An other data that can increase the precision of the calculation, is the value of
- engine inertia [kgm2] → the value refers to the inertia of the crankshaft and of the accessories mounted on it (for example ignition, clutch, flywheel, etc.);

This value isn't easy to find anyway you can use these standard value:

60 cm3 → 0.0016
125 cm3 without gearbox → 0.0018 – 0.0025
125 cm3 with gearbox → 0.0035 – 0.0045

FINAL DRIVE

You must enter the number of teeth of front and rear sprockets that you've in the session that you want analyze.

REAR WHEEL

In the software there are already the list of all the main wheels, and you can select if the tires are mounted on rims of aluminium (xxx – Alluminio), or of magnesium (xxx-Magnesio)
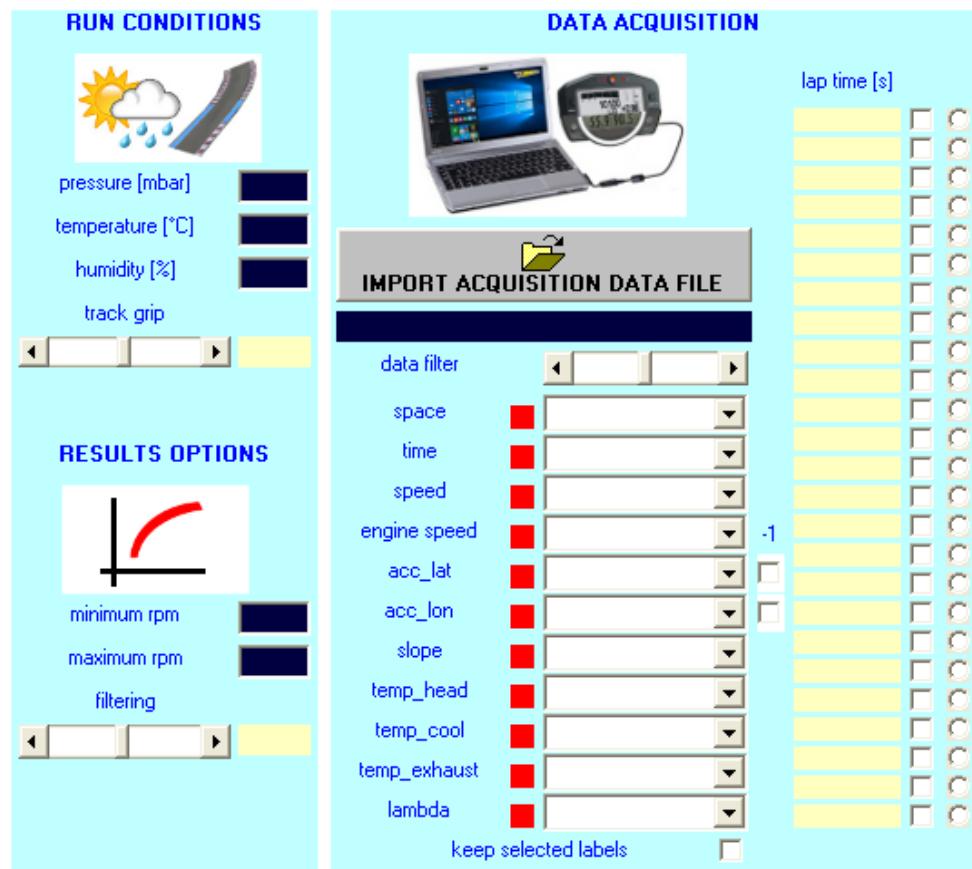
Anyway if there isn't your wheels, or you want modify some data you can enter manually these data.
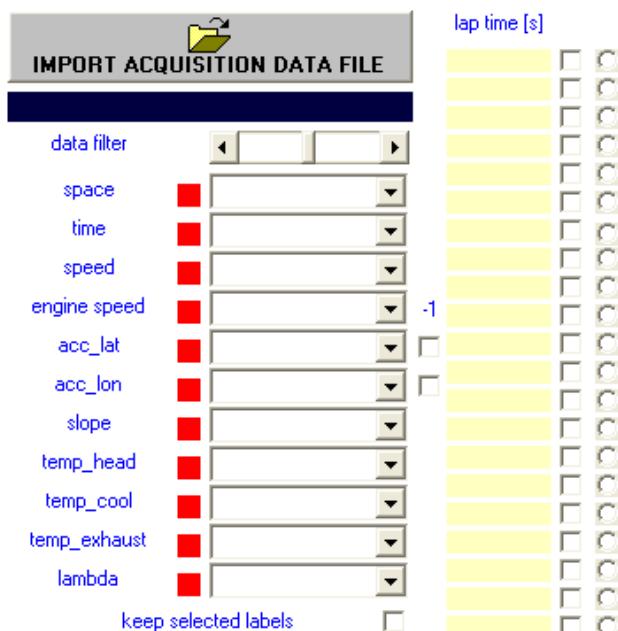
Except for the rear diameter these data aren't easy to find, therefore if there isn't your wheels, we advice to use the data of the wheels more similar at your case, or contact NT-Project to have indications on how modify the data for your case.

Also in this case is possible to save the new data in the list, entering the name of the new wheel and clicking SAVE

DATA ACQUISITION

From this area you can use your acquisition files to calculate the power curve of your engine.

IMPORT DATA ACQUISITION FILE

For first by your acquisition data software, you must open the run that you want to analyze, and export it to a file in * .csv format, at this point on this screen of the software by clicking the "IMPORT FILE DATA ACQUISITION" button you can load the file * .csv that you've exported.

The software recognizes automatically your acquisition system, and if you've the default name for the channels necessary to make the analysis, you'll see the corresponding squares of color green, if instead you've different names for some channels, you'll have the square red, in this case from the list beside, you must simply select the right name of your channel for the specific quantity.

If you want keep the channel name selected you must simply check the box (keep selected labels)

In this area you can also select the laps that you want use to calculate the power curve (we advice to check five, six laps with the best laps).

Moreover to have the maximum precision in the calculation of the power curve in the ACQUISITION tab you can enter the weather and the level of the grip, of the file session that you are using.
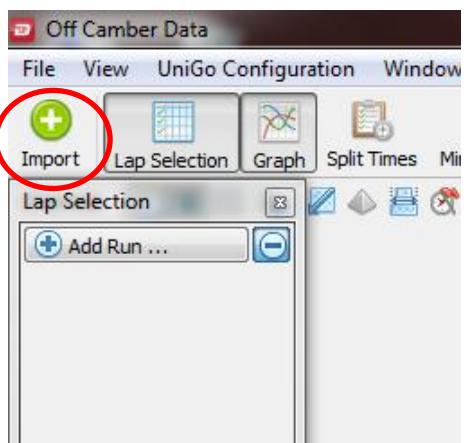
If you see that the power curve calculated take account also rpm out of the range of normal utilization of the engine, you can restrict the calculation entering the minimum and the maximum rpm that you want for the power curve.

If you see that the power calculated is far away from the engine performance that you expect, you can try to move the option filtering. Probably your acquisition not work perfectly, and you need to increase the filtering.
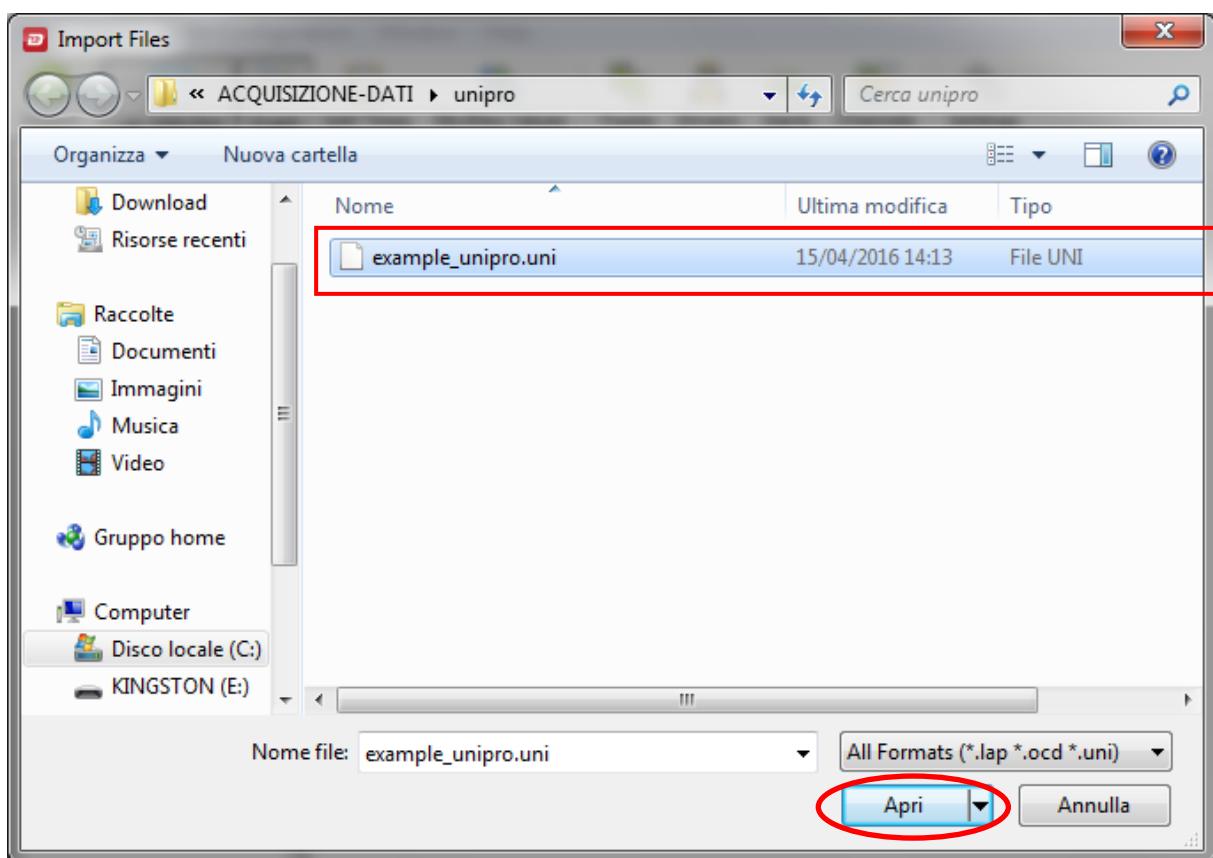
Below there are the instructions to export the file CSV from the different acquisition system.

DATA ACQUISITION SYSTEM UNIPRO or ALFANO
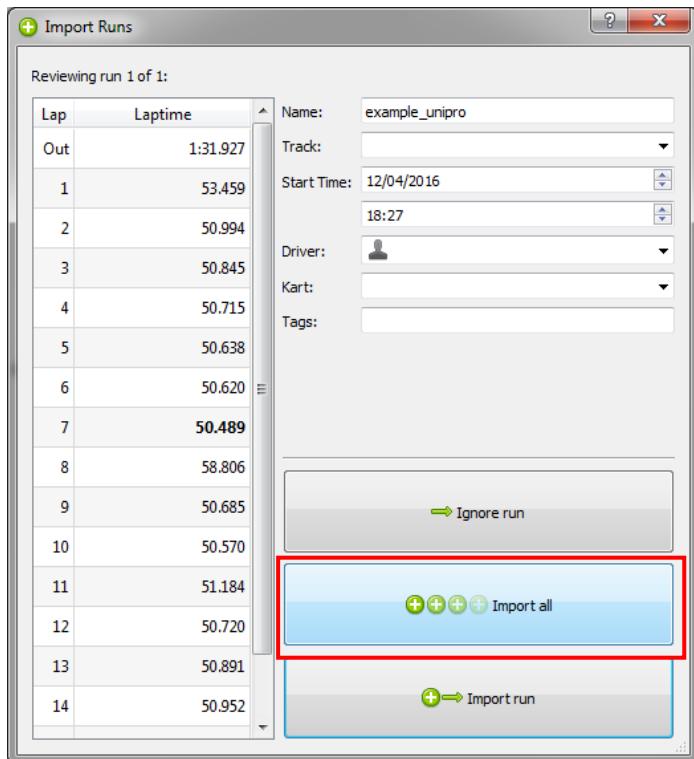
Open the software OFF CAMBER DATA V45 and load the run that you want analyze clicking on the button "Import"
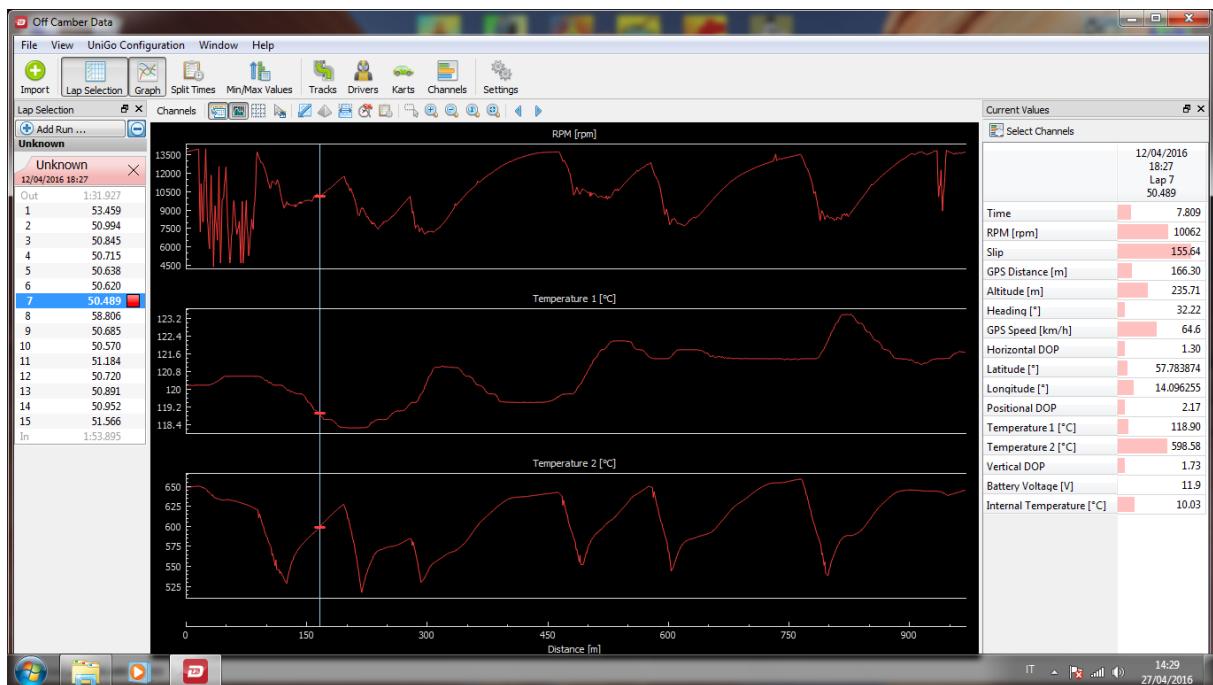

Select the file (*.uni , *.lap, *.ocd) with the run that you want analyze and click "Open"
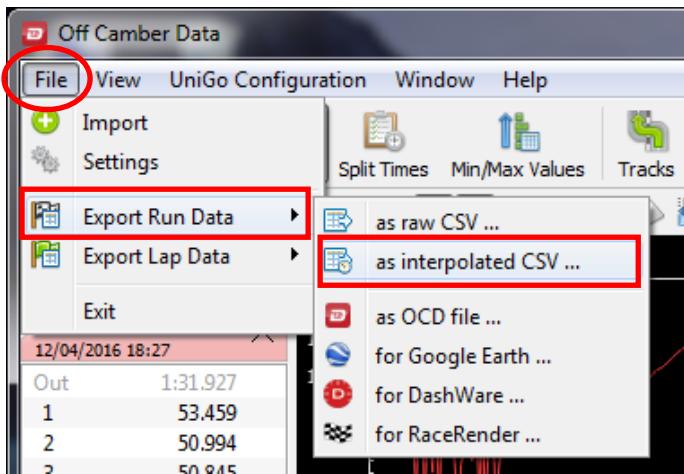

In the new window click on the button "Import All"
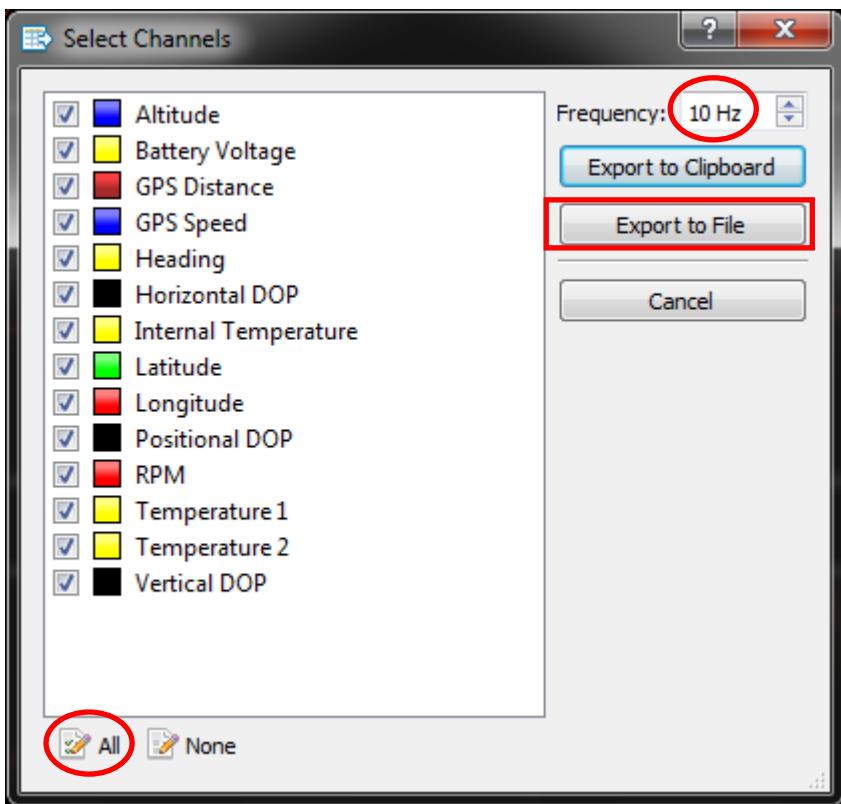
So you'll have the run loaded

At this point you must simply click on the menù "File", select "Export Run Data" and therefore click on "as interpolated CSV …"
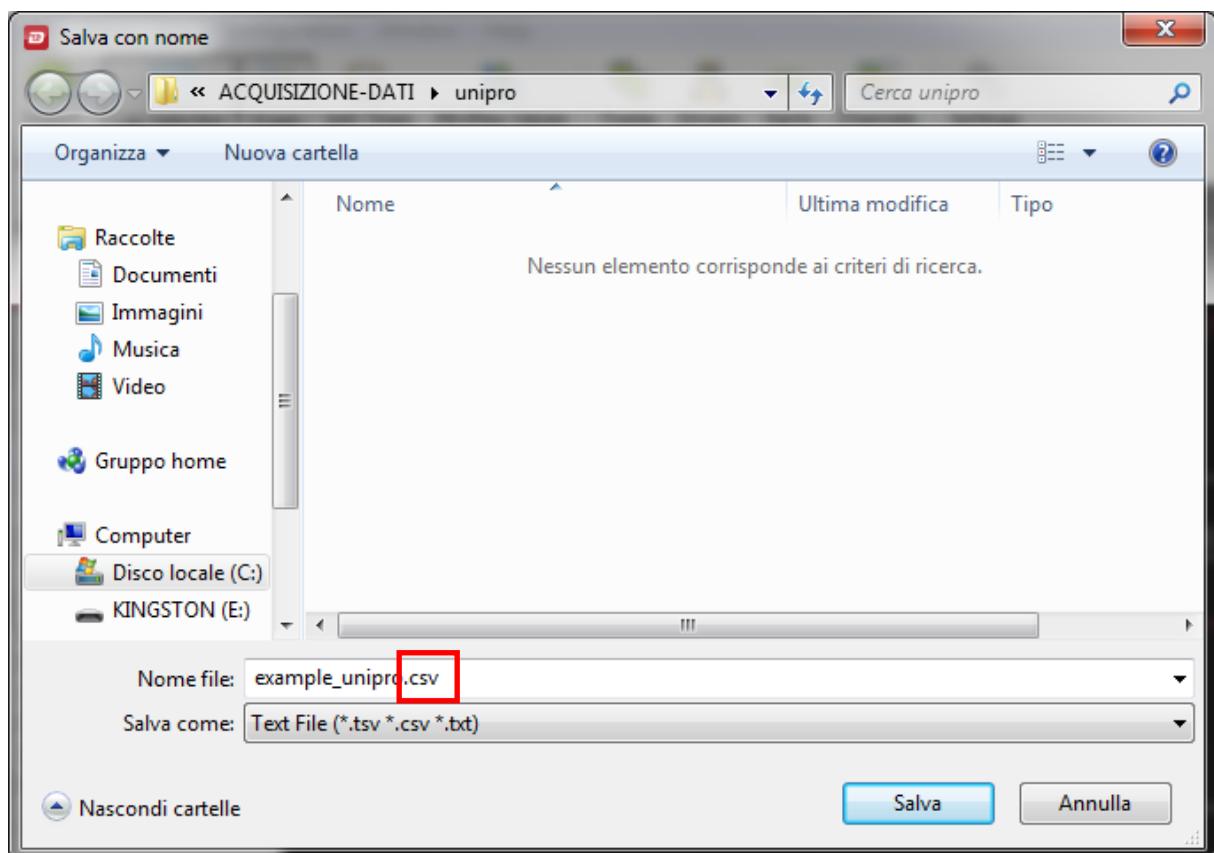
In the new window select "All" the channels, "10 Hz" how frequency, and then click on the button "Export to File"

Select the directory where you want save the file exported, and give it a name.
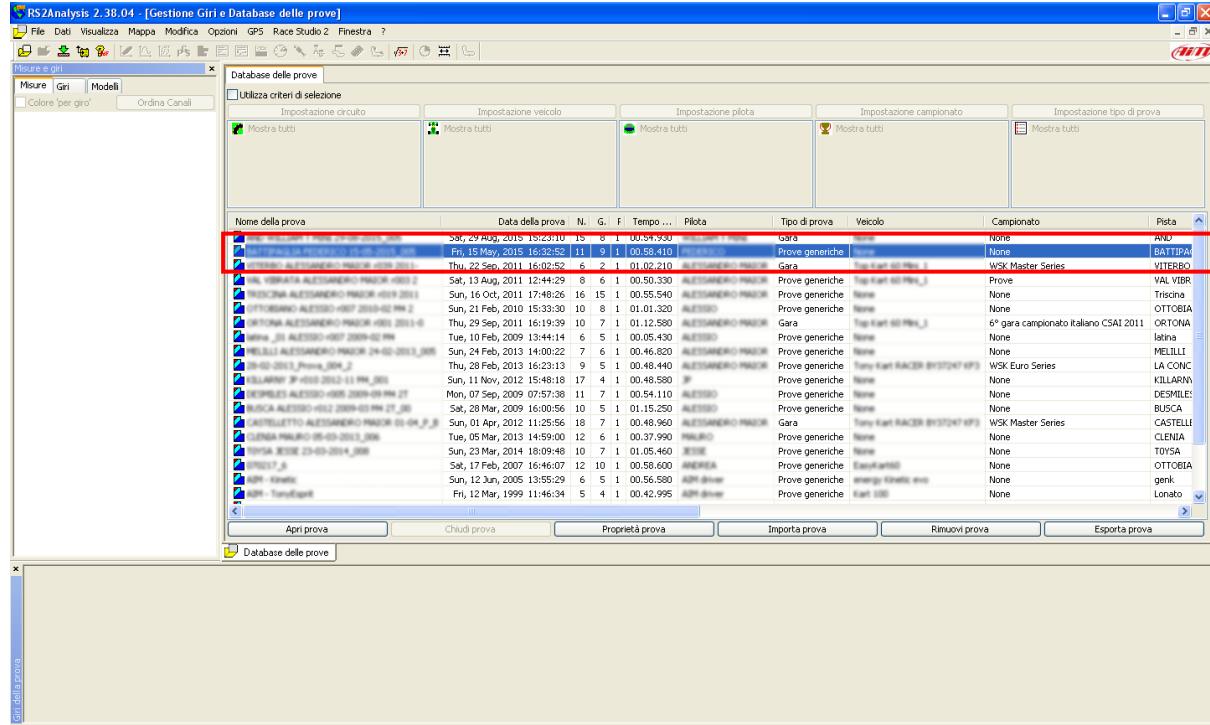
In the name it's important that you write also the extension .csv before to save, for example runxx.csv
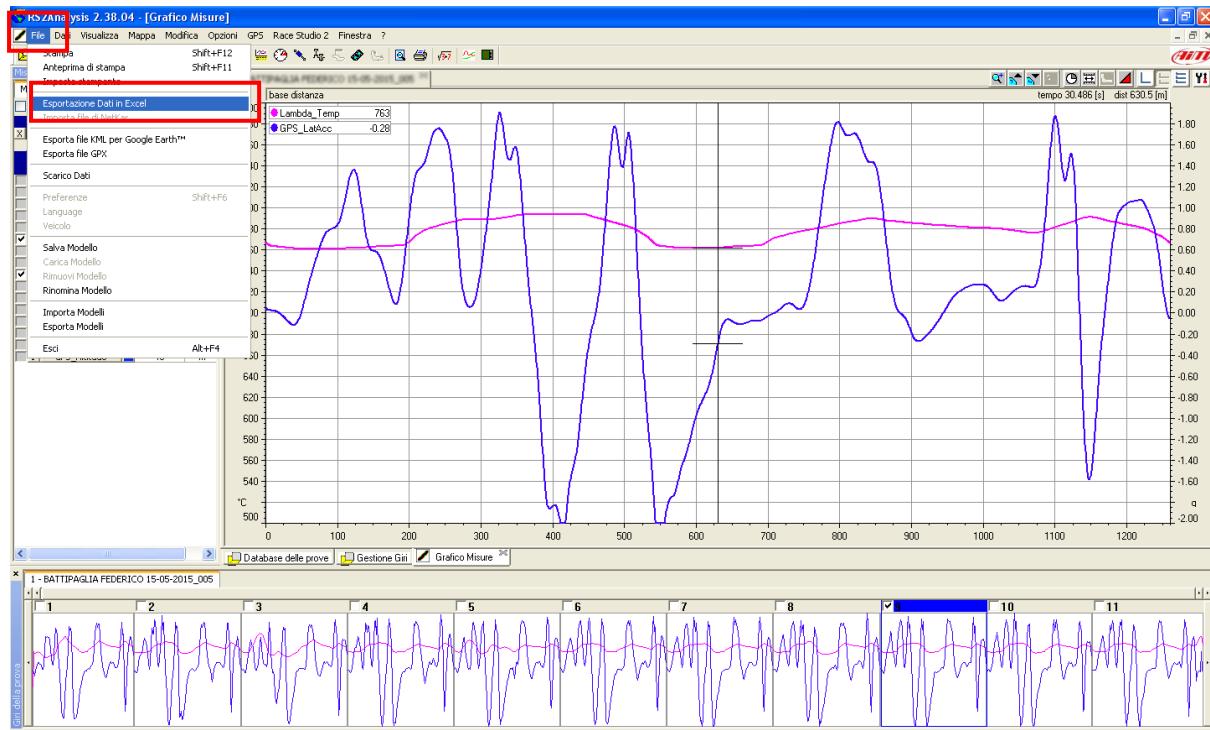
In the file exported from unipro, is better to select lap from 2 or upper, because the first lap is of exit from box.

DATA ACQUISITION SYSTEM AIM

Open the software RACE STUDIO 2.XX and load the run that you want analyze
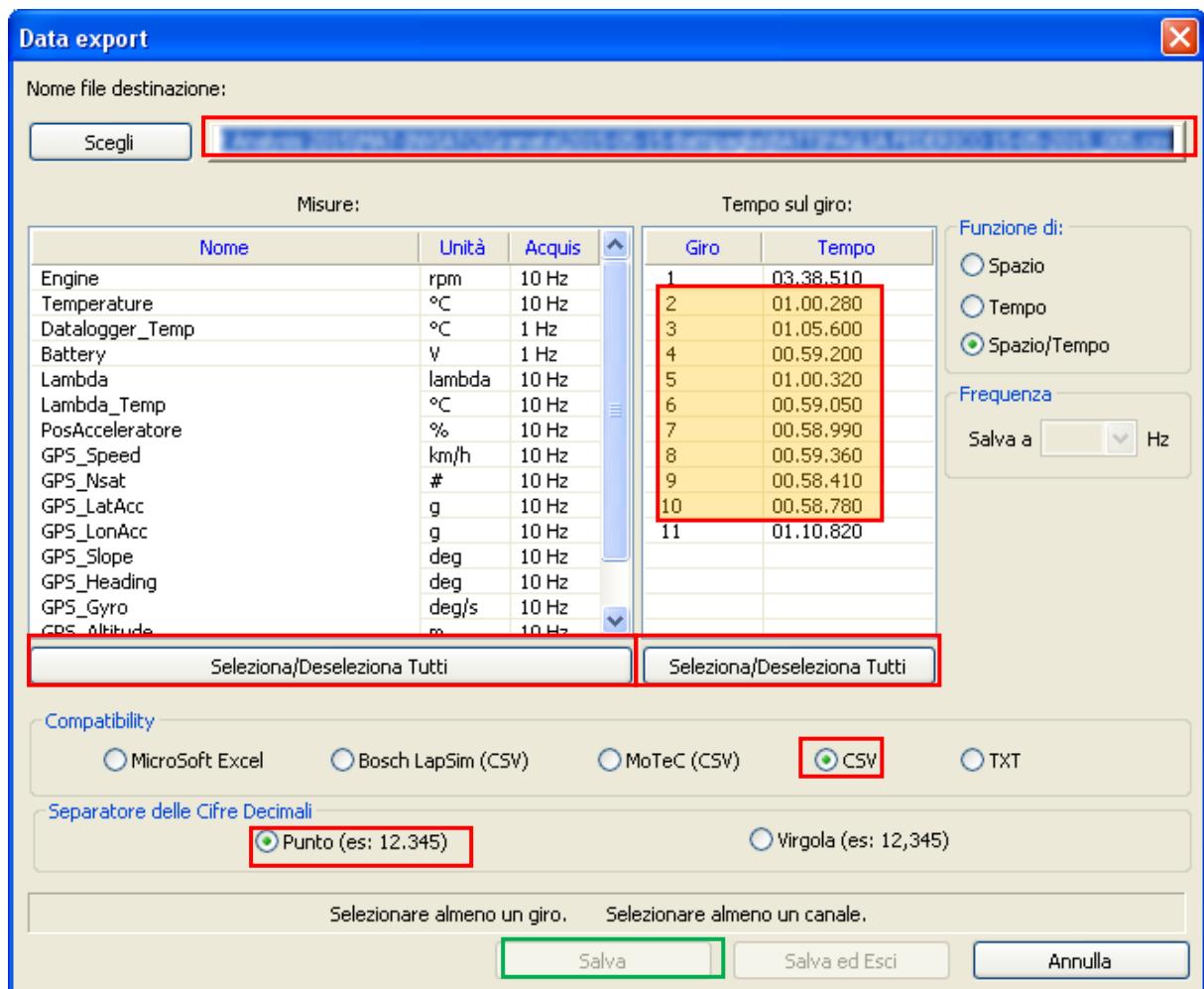
After that you've loaded the run, go to menu "File" and select "Export Data in Excel"
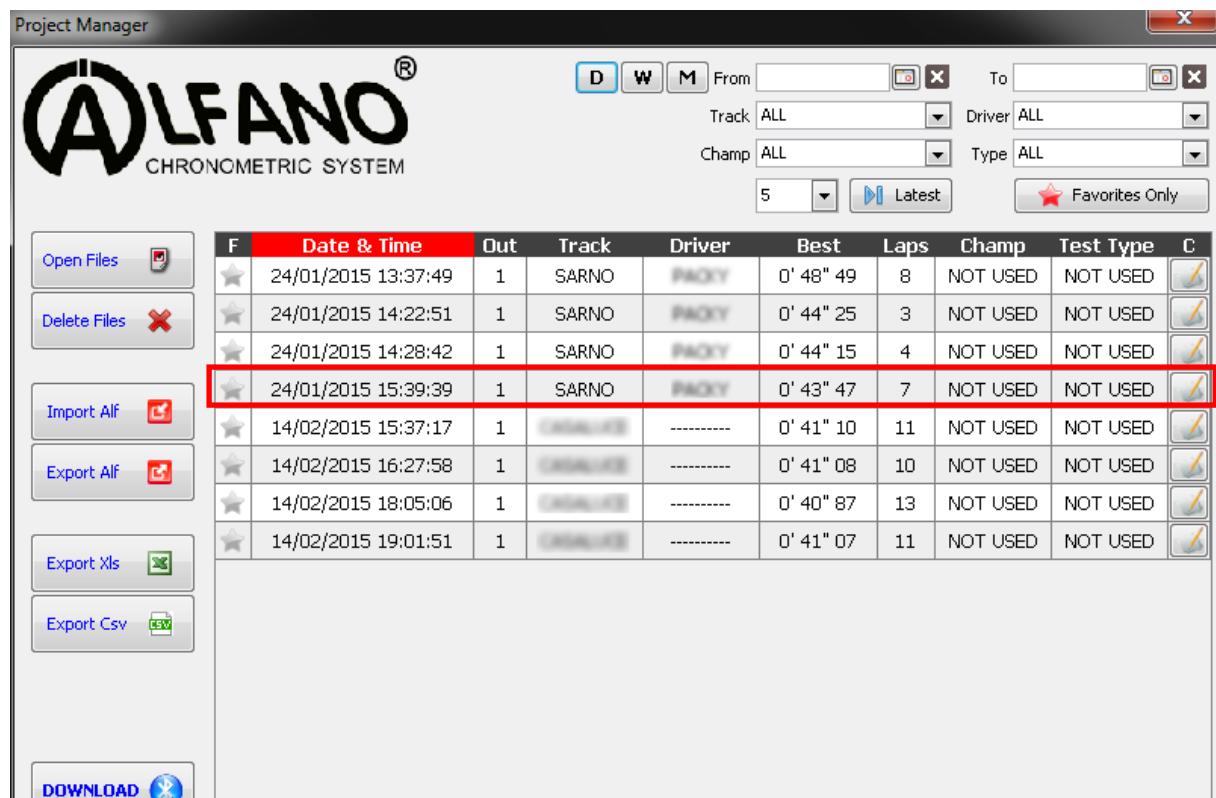
At this point select:

- all the measure
- all the good laps
- the dot like separator decimal
- csv how format
- the name of outfile

DATA ACQUISITION SYSTEM ALFANO (old system)

Open the software Alfano VisualData2 v1.X.XX and load the run that you want analyze
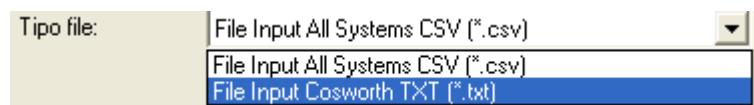
At this point click on the button "Export Csv" , select the directory where you want save the file exported.

At this point click "Save" and you've the file csv that you can import in the software Virtual Dyno to analyze it.

DATA ACQUISITION COSWORTH
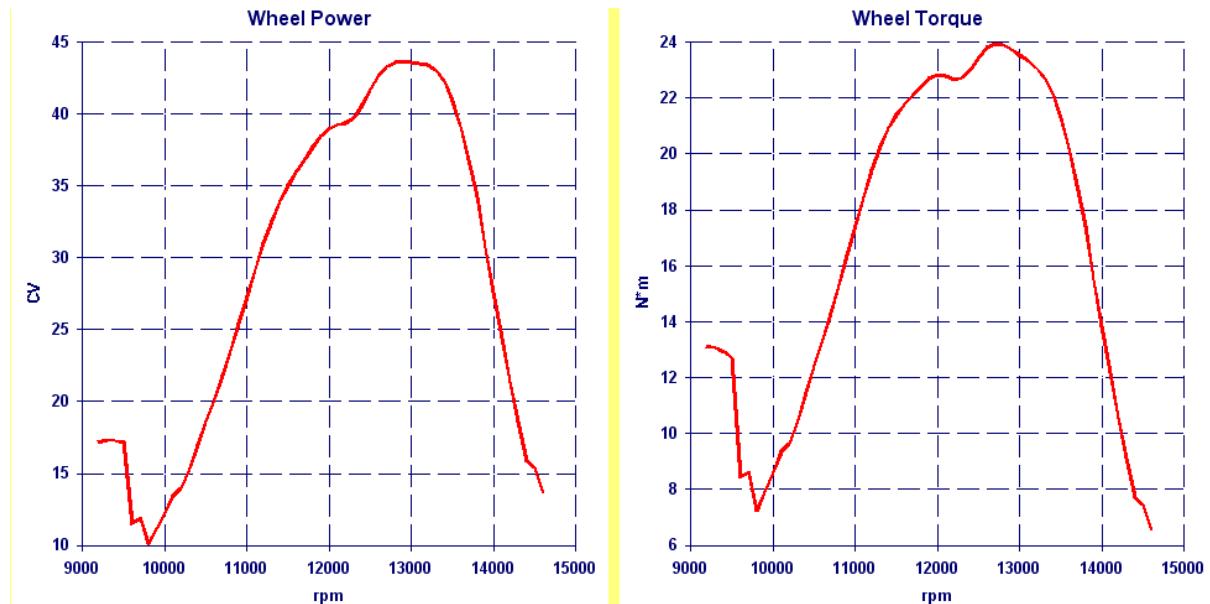
To import the files exported from PI-TOOLBOX-DATA is necessary select the type file TXT in the window that appear after that you've clicked on the button of import of the software
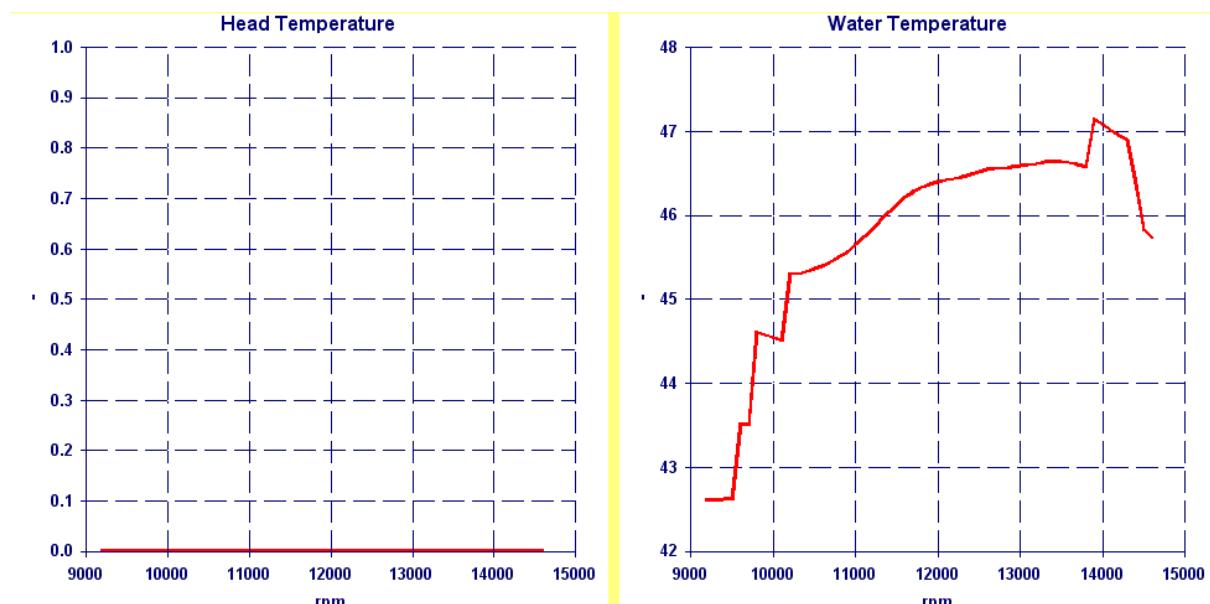
results
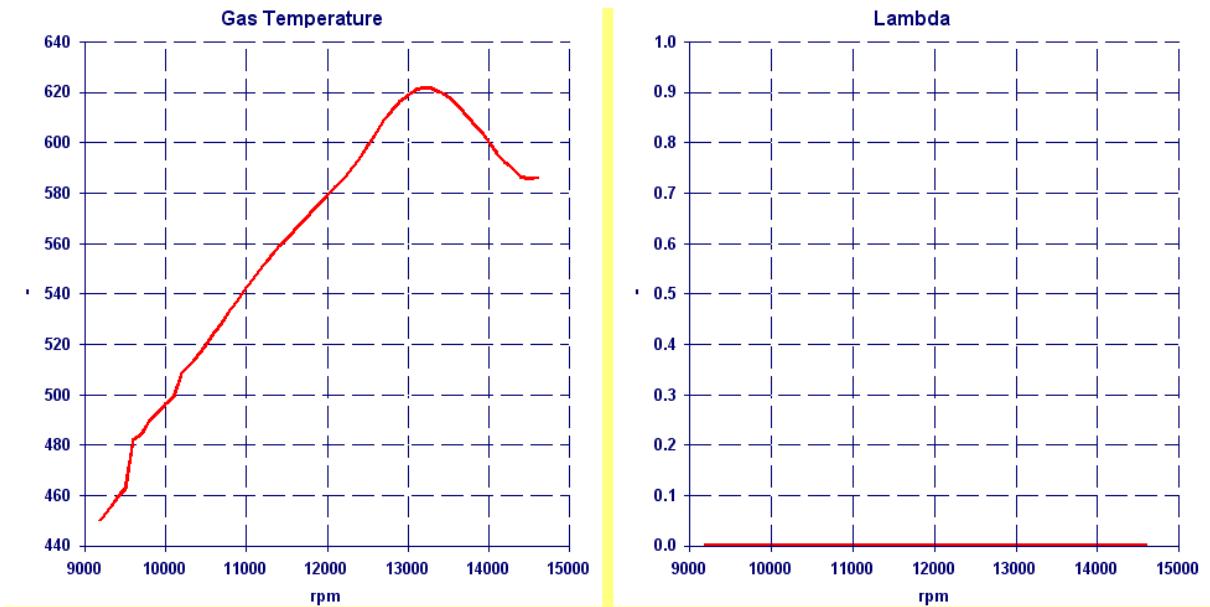
After entering the data, through the START button you can to begin the calculation.

The software will process all of the data of the session to calculate in function of engine speed the power and the torque.
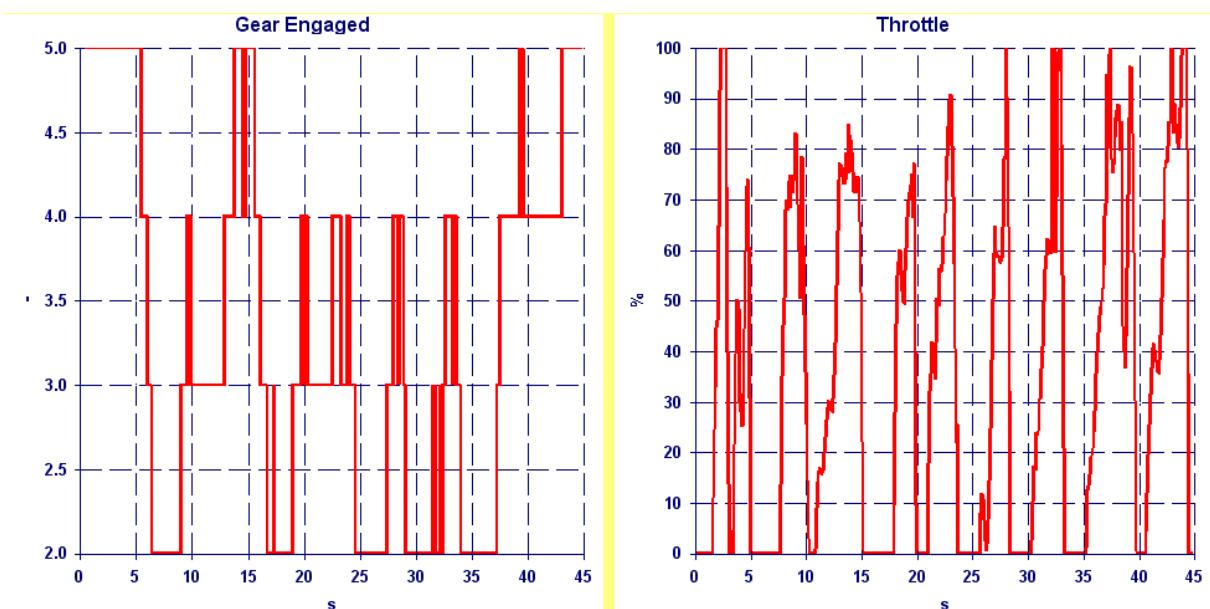

Moreover if you've the sensors allows to see how change the temperature of head, water and exhaust, and lambda, in function of engine speed. So you can analyze the engine as you're at dynometer

Gas Temperature / Lambda
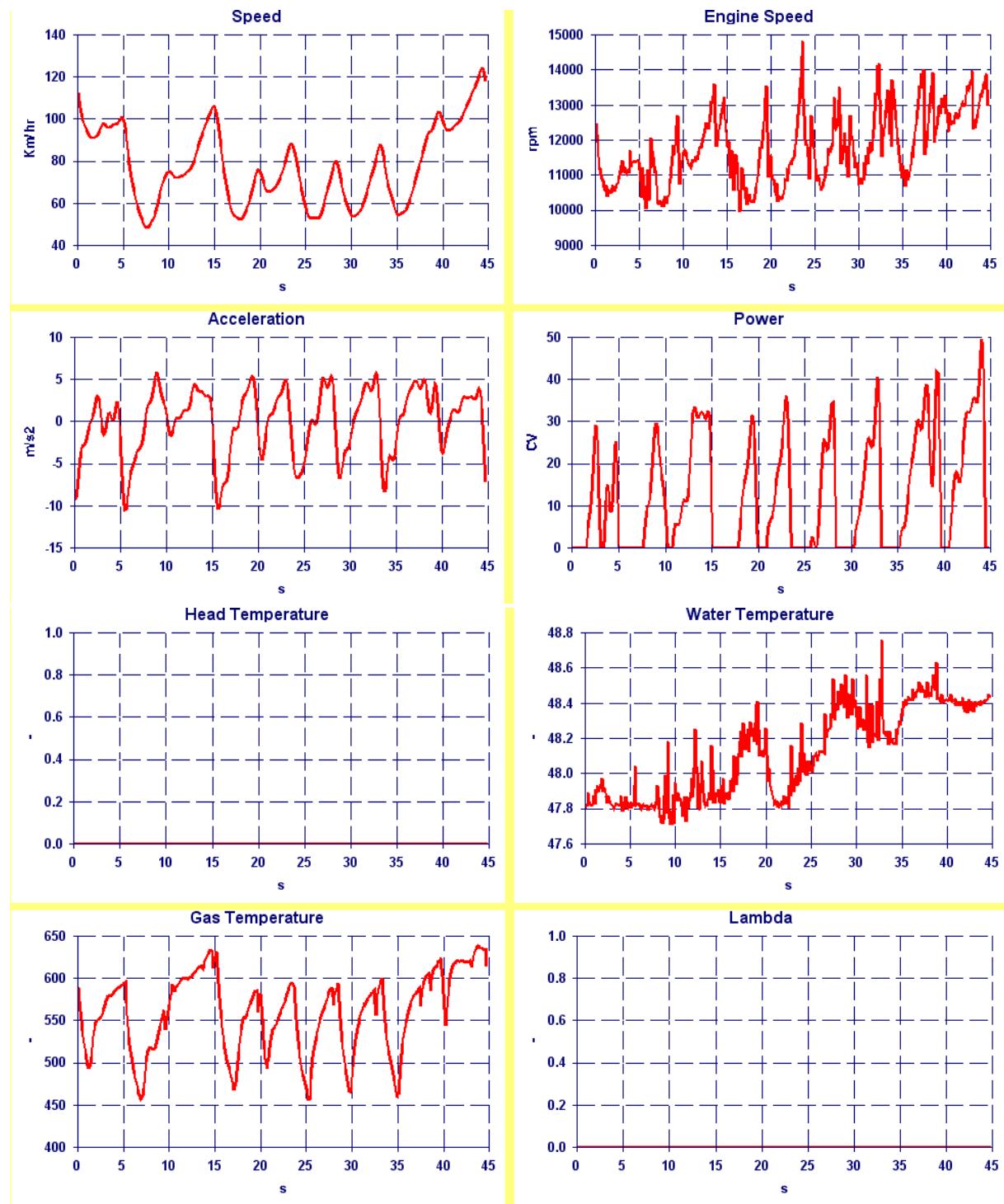
The software allows also to analyze the use of gearbox and of the throttle in the lap.

Gear Engaged / Throttle

In addition at these data, the software summarizes the results of your acquisition on the selected lap, and this can be useful when you make the comparison of two sessions.
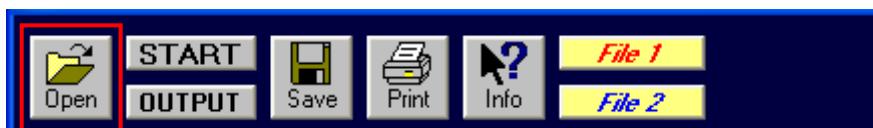
Opening and saving data

The data can be saved in a file * .ena through the "Save" button.

The stored data can be easily retrieved through the button "OPEN" and even if they were saved to the output through the OUTPUT button is possible to instantly review the results and move in the graphs through the << and >> button.


output

All the values indicated above will be shown in special graphics at the end of the calculation, furthermore the quantities processed will be saved in the following files:

STARTFILENAME.OUT

Where will be saved the quantities related to the engine as if you were on the dyno.

STARTFILENAME.TEL

Where will be saved the instantaneous quantities for the selected lap.

STARTFILENAME.CBD

In this file there are saved the results of the power in the format usable with the software SET-UP Gear, and SET-UP Driving.

comparison results

After processing and saved the data of a session you can compare the results with those previously saved of an another session.
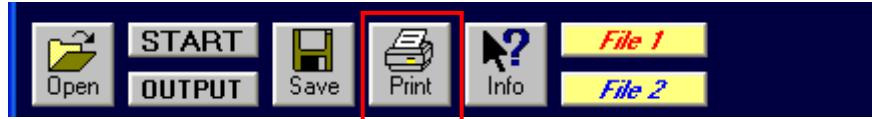
After that you've opened through the button "Open" or "File 1" the first session to compare, through the button "File 2" will choose the second session. At this point clicking the button "Comp" the software will automatically show the graphs of the variables compared. RED color will distinguish the results of file1, while the blue ones of file2.

Print

At the end of the calculation you can print the results obtained through the PRINT button.


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