



Insoric RealPower

Technical description

Dear valued customer

By purchasing **Insoric RealPower** you have acquired a high-quality product distinguished by special capabilities and permanent innovation in the field of performance measurement. Congratulations on your purchase of this high-quality product and thank you for your trust.

The Insoric Team

Imprint

This instruction manual is a publication by Insoric AG, Chrüzerwis 18,
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The instruction manual is part of the Insoric RealPower measuring system. It contains important information on commissioning, handling and operation. In order to ensure proper and safe operation, all instructions must be precisely followed. The same applies if you pass on the product to third parties.

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This instruction manual reflects the technical status at the time of going to print. Later changes that are not included in the instruction manual and further guidance and assistance can be found on our website at www.insoric.com.

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1. Technical description

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1.1. Recording power data

Insoric RealPower enables precise measurement of vehicle performance.



The readings are taken from the vehicle's road wheel.
All data produced during a road test is recorded and internally stored by the RealPower module attached to the vehicle wheel.

1.2. Analysing the data

Using the RealPower software specially developed for this application, analysing the data is simple.



After a road test and having installed the RealPower software, you connect the RealPower module to your PC using a USB lead.

You can then enter various parameters relating to a road test and save vehicle-related details in the RealPower program. There are also functions for selecting individual measurement results and producing test certificates for them.

The use of the RealPower module and the subsequent data analysis on a PC do not require any kind of specialist knowledge. Consequently, a key feature of the product is that it can be used immediately without knowing the specifications of the vehicle being tested.

The following performance data can be measured with the Insoric RealPower system:

- Wheel power
- Engine power
- Road speed
- Maximum torque
- OBD data import *

* As of software version 2.0

1.3. Product specifications

The measuring system and all required accessories are supplied in a case.

RealPower Dyno-System Professionell



RealPower Dyno-System Basic / RealPower Dyno-System Premium



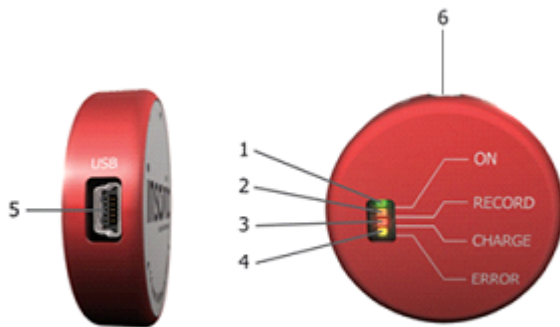
*** Following software version 1.6.0, setup will take place online and registration will be done via the licence key.**

This product left our factory in perfect condition. Please check the case after receipt for any damage and to make sure nothing is missing, and inform us immediately if anything is not as it should be.

To maintain proper working order of the product and ensure trouble-free operation of Insoric RealPower, it is imperative that you follow the directions in this instruction manual.

Use for purposes other than that described in the instruction manual may impair or damage the product. Insoric RealPower must not be modified or converted as doing so will void the manufacturer's guarantee.

1.4. Controls and indicators - RealPower Module



- 1 Green LED – ON mode
- 2 Orange LED – Recording mode
- 3 Red LED – Charging battery mode
- 4 Yellow LED – Error mode
- 5 USB socket
- 6 RealPower module "ON/OFF" and mode selector button

1.5. Switch functions

Switching on the RealPower module – ON mode

Press and hold the ON/OFF button (for 1 sec) > The RealPower module is now activated (green "ON" LED flashes).

Starting recording – Recording mode

Press and hold the ON/OFF button again (for 1 sec) > The RealPower module switches to recording mode (green "ON" LED and orange "RECORD" LED both flash).

Stopping recording

Press and hold the ON/OFF button (for 1 sec) > The RealPower module switches back to ON mode (green "ON" LED flashes).

Switching off the RealPower module

Press and hold the ON/OFF button (for 3 sec) > The RealPower module is now deactivated (no LEDs flashing).

1.6. LED indicators

Green "ON" LED – ON mode

Signals by flashing that the RealPower module is switched on.

Orange "RECORD" LED – Recording mode

Signals by flashing in alternation with the green "ON" LED that the RealPower module is in recording mode.

If the "RECORD" LED remains constantly lit, it indicates that the recording capacity of the RealPower module has reached its limit (the maximum recording capacity is 80 minutes). The RealPower module memory then has to be cleared using the RealPower software application before further road tests can be carried out. (see chapter 2.7.4)

Red "CHARGE" LED – Charging battery mode

When constantly lit, signals that the internal battery is being charged (only when the RealPower module is connected to a PC by the USB lead).

Yellow "ERROR" LED – Error mode

Signals an error. If the yellow LED does not go out after the RealPower module is switched off and on again, please contact the manufacturer via the website www.insoric.com/support.

If the "RECORD" LED remains constantly lit, it indicates that the recording capacity of the RealPower module has reached its limit (the maximum recording capacity is 80 minutes). The RealPower module memory then has to be cleared using the RealPower software application before further road tests can be carried out.

1.7. Software

Following software version 1.6.0.0

Following version 1.6.0 download, setup and registration will be done by using the enclosed license key. **No** setup disc will be enclosed anymore.

During installation, the PC must be connected to the Internet.

For the registration and the "obtaining" of the license file this connection is necessary and must be present also afterwards at least every 3 months (or 30 starts) again!

Up to software version 1.5.4.0

Supplied with the product, there is an installation CD/DVD containing the RealPower software for analysing the recorded power data. The RealPower software requires a special driver which is also supplied on the installation CD/DVD. Please note the following basic and system requirements for using the RealPower software:

Basic requirements:

- 2 available USB ports
- Printer (preferably a colour printer)
- Keyboard
- Mouse with scrolling wheel

System requirements:

- Microsoft® Windows 7, 8, 10
- At least 1 GB of RAM
- Hard disk with at least 2 GB of free space
- Graphics card with min. resolution of 1024 x 768
- Adobe Acrobat Reader®

1.8. Licence key

To use Insoric RealPower you require a licence issued by Insoric. That licence is supplied with the product in the form of a USB stick, i.e. there is a licence key stored on the USB stick. To be able to use the RealPower software, the USB stick must be plugged into your PC – otherwise an error message will be displayed.

You can install the RealPower software on multiple PCs. However, the program will only run in conjunction with the licence key. If you lose the licence key, you will not be able to start the RealPower software.

The licence key controls the range of functions available in the RealPower software and the number of power tests that you have available.

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2.1. Safety instructions

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2.1.1. Safety warnings - Definition



This warning indicates a **potentially** dangerous situation that **could** lead to **serious or fatal injuries** if the safety precautions are not followed.



This warning indicates a potentially dangerous situation that could **lead to minor or slight injuries** if the safety precautions are not followed.



This warning indicates the possibility of **damage to property** if the safety precautions are not followed.

Special tips that can simplify working with Insoric RealPower are printed in *Italics*.

With the exception of the instructions given in Section 2.1.2, the safety warnings appear next to the passage of text to which they relate.

2.1.2. Safety warnings - General rules

Before using Insoric RealPower for the first time, please read through the whole of the instruction manual as it contains all the important information for correct operation.

Operation of the Insoric RealPower measuring system is at the user's own risk. We accept no liability for personal injury or damage to property caused by incorrect use or failure to follow the safety instructions. In such cases all guarantee entitlement will also be void.

The RealPower module casing must not be opened nor its contents interfered with or modified. In such cases all guarantee entitlement will be void.

The applicable statutory road traffic regulations and highway code of the country in which the Insoric RealPower is used must be observed. Compliance with those regulations is the responsibility of the user alone.

When using Insoric RealPower in schools or educational establishments, supervision by trained technical staff is absolutely imperative.

The RealPower module and its accessories are not toys and should not be operated by children!

The statutory safety regulations for prevention of road traffic accidents are to be observed.

2.2. Using for the first time

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2.2.1. Installing RealPower software and driver

New !

With the introduction of the "RealPower Speed" software version 1.6.0.0, the installation CD is no longer included with the hardware. Software **download** , **installation** and **registration** are done via the supplied license key.

Installation Software Version from 1.6.0.0

After downloading the downloader from www.insoric.com the file "RealPowerDownloader.exe" is saved in the directory

"Download" on your hard disk. A double click on the file starts the installation process of the RealPower software.

The RealPower software is not a network application. Please install it locally on your hard disk.

Make sure that the driver is installed correctly on your PC. Only this way a communication between RealPower software and RealPower module is possible.

2.2.2. Charging the battery

Before using the RealPower module for the first time and/or before the first road test, its battery must be charged. That is done using only the USB lead supplied.

Connect the USB lead to the RealPower module and a free USB port on the PC. The first time it is charged, the RealPower module should remain connected until the red "CHARGE" LED goes out (see also Section 1.6).

The RealPower module can be charged on any PC that has a USB port.

NOTICE

Risk of property damage

Only connect the RealPower module to a USB port on a PC. That is the only way to ensure it is charged at the correct voltage.

If the electronics of the RealPower module are damaged due to charging the battery incorrectly > guarantee will be void.

2.3. Preparing for the road test

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2.3.1. Road test route

To measure the power, acceleration or torque on a vehicle, a suitable road test route is required. Ideally, the course of the road should contain no uphill or downhill gradients or corners and should be at least 1000 m long. The route should provide clear visibility along its entire length and allow a speed of at least 80 kph.

2.3.2. Attaching the RealPower module

To carry out a road test, the RealPower module has to be attached to the wheel of the vehicle being tested. There are fixing systems supplied with the product for the purpose.



Risk of accidents and property damage

If the RealPower module were to become detached from the wheel during the road test it would pose a danger to other road users.

In addition, the RealPower module could be destroyed.

Use only the fixing systems supplied by the manufacturer.

- **Risk of dirt:** the wheel must be cleaned using a dirt and grease removing cleaner before attaching the RealPower module. Do not use cleaners that are corrosive or contain solvents.
- **Risk of moving parts and wheel trims:** the RealPower module must not be attached to moving parts of the wheel, wheel trims or hub caps that could become detached when the vehicle is moving.
- **Risk of uneven attachment face:** wheels with an uneven or ridged centre are not suitable for attaching the RealPower module. The attachment face must be completely flat.
- **Risk of eccentricity:** the RealPower module must be attached exactly in the centre of the wheel.

When carrying out the road test avoid extreme weather conditions such as heavy rain, hail showers or heavy snow falls.



Risk of property damage

There is a risk of damage to the RealPower module from splash-water or dirt in bad weather.

Attach the protective cap supplied to the RealPower module.

As a fundamental principle, the RealPower module should always be fixed on the passenger side. To counteract the spin that can occur on a driving wheel, it should be attached to a non-driven wheel. (Check whether car is front or rear-wheel drive!)

For cars with four-wheel drive it doesn't matter whether the module is attached on the front passenger side or rear passenger side.

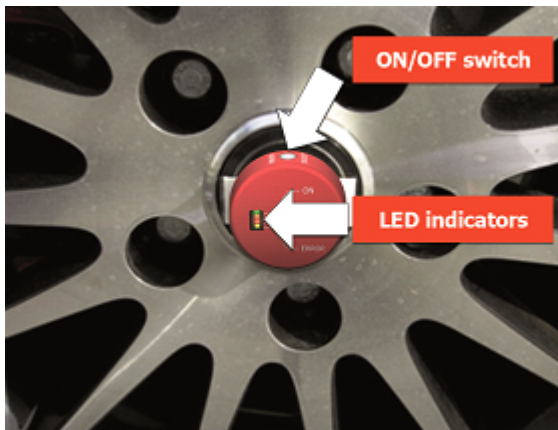


Attaching the RealPower module is very easy: remove the protective foil from one side of the fixing system and fix it to the back of the RealPower module (*the side with the Insoric logo*). In that way, the LED indicators remain clearly visible.

Then remove the protective foil from the other side of the fixing system and press the RealPower module as **exactly as possible** onto the centre of the wheel.

*The RealPower module is **not** designed for continuous use and must be removed from the wheel again after completing the road test.*

2.3.3. Activating the RealPower module



Switch on the RealPower module before starting the road test. To do so, press the "ON/OFF" button twice in succession.

The RealPower module is now in recording mode.

The orange "RECORD" LED flashes in alternation with the "ON" LED.

Please note that the recording capacity of the module memory is 80 minutes. If the RealPower module has already been used before, we recommend that you delete the module data before each new road test (see Section 2.7.3).

If the recording capacity limit is reached during a road test, the RealPower module automatically switches off and no further data is recorded. In that case, the data has to be read out and the memory cleared as described in Section 2.7.3 before the RealPower module can be used again.

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2.4.1. Vehicle safety

Before commencing the road test, the vehicle must be checked for roadworthiness and/or damage that might impair its handling characteristics and road safety.



Risk of accidents

There is a risk of accidents if tyres are not inflated to the correct pressure or are worn or damaged.

Check the tyre pressure and examine the tyres for damage and penetration by foreign objects.

Incorrectly adjusted tyre pressure affects the wheel diameter and, therefore, also the measurement results.

2.4.2. Road test safety

Use of this product is at your own risk. Inadequate attachment of the RealPower module and incorrect use of Insoric RealPower are the responsibility of the user.

During the road test, the general statutory road safety regulations apply.

When performing the road test, always keep within the legally permitted speed limit. Desist from extreme and risky driving manoeuvres.



Risk of accidents

An unsuitable choice of road test route could place you and other road users at risk.

Do not continue with the road test if the circumstances or the road or weather conditions are not suitable.

Avoid routes with

- heavy traffic
- obscured visibility
- junctions or crossroads
- agricultural traffic
- steep downhill gradients

Do not carry out road tests on roads

- where children are playing
- through built-up areas
- with poor road surfaces
- with snow or ice on the surface
- with poor visibility due to fog or darkness

Discontinue the road test if any of the above circumstances occurs unexpectedly.

2.4.3. Road test - Power measurement

Before the road test, switch off air conditioning and other equipment and vehicle functions that affect engine power.

The test involves two stages. Depending on the prevailing traffic conditions, the two stages (acceleration and roll) can be carried out in a single run or separately with an interval in between.

Power measurement using Insoric RealPower consists of an **acceleration** phase followed by a **roll** phase. During the acceleration phase, a power curve is recorded up to maximum revs. During the roll phase, the vehicle-specific loss factors are recorded.

Road Test

Depending on vehicle power, the **acceleration phase** is carried out in 3rd or 4th gear. Ideally, the acceleration phase should start at **approx. 1000 - 1500 rpm**. Now press the accelerator to the floor and accelerate the car until the rev counter needle reaches **the red area, respectively the shift point if using an automatic gearbox**.

Make a mental note of the engine speed reached!

NOTICE Legally permitted speed

Be sure to observe the allowed maximum speed for the road you are driving on.

After that, you disengage the clutch so that the vehicle is **rolling**. You should leave the gear lever in the gear previously selected. If using an automatic gearbox, select neutral if possible.

If it is not possible change to the neutral position, select the highest gear while rolling and take the foot of the throttle.

The **roll phase** should – allowing for the conditions on the road test route – last as long as possible. The **speed difference** between declutching and the end of the roll phase should ideally be **at least 30 km/h**.

Several acceleration and rolling phases can also be carried out in succession. Combining multiple test phases provides for greater possibilities when subsequently analysing the power data.

2.5. After the road test

2.5.1. Removing the RealPower module	30
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2.5.1. Removing the RealPower module

After completing the road tests, the RealPower module should be switched off using the "ON/OFF" switch (press and hold for approx. 3 sec) and removed from the wheel as follows:

Pull on the tab of the fixing system between the RealPower module and the wheel for several seconds lengthwise. The RealPower module can then be removed easily from the wheel without using force. Afterwards, remove the fixing system from the RealPower module.

*The RealPower module is **not** designed for continuous use and must be removed from the wheel after completing the road test. Use only fixing systems recommended by Insoric AG. Use fixing systems once only.*



Risk of accidents and property damage

Using the fixing systems more than once could endanger other road users if the RealPower module were to become detached from the wheel during the road test. In addition, the RealPower module could be destroyed.

2.6. Preparing for analysis

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2.6.1. Preparing the data

To calculate the power data ("maximum levels" and "performance diagram") and to produce the test certificate, the RealPower software requires the following additional data:

- **Details from the car documents** (registration certificate and owner's manual)
- **Wheel diameter** (see Section 2.6.2)
- **Gear and maximum revs** (details noted by the driver during the road test)
- **Meteorological data** at the time of the road test (barometer/thermometer, see Section 1.3, item 7)

A "Data checklist" is supplied with the product to simplify the process of completing the data to be entered manually.

2.6.2. Measuring the wheel diameter

The wheel diameter is determined with the wheel measuring device * and later entered as a parameter in the RealPower software.



The wheel diameter should be measured horizontally, as in that position there is always sufficient space between the wheel and the wheel arch.

To obtain the precise measurement, the diameter must be measured horizontally through the centre of the hub.

*Only included in RealPower Professional

2.7. Analysing the data

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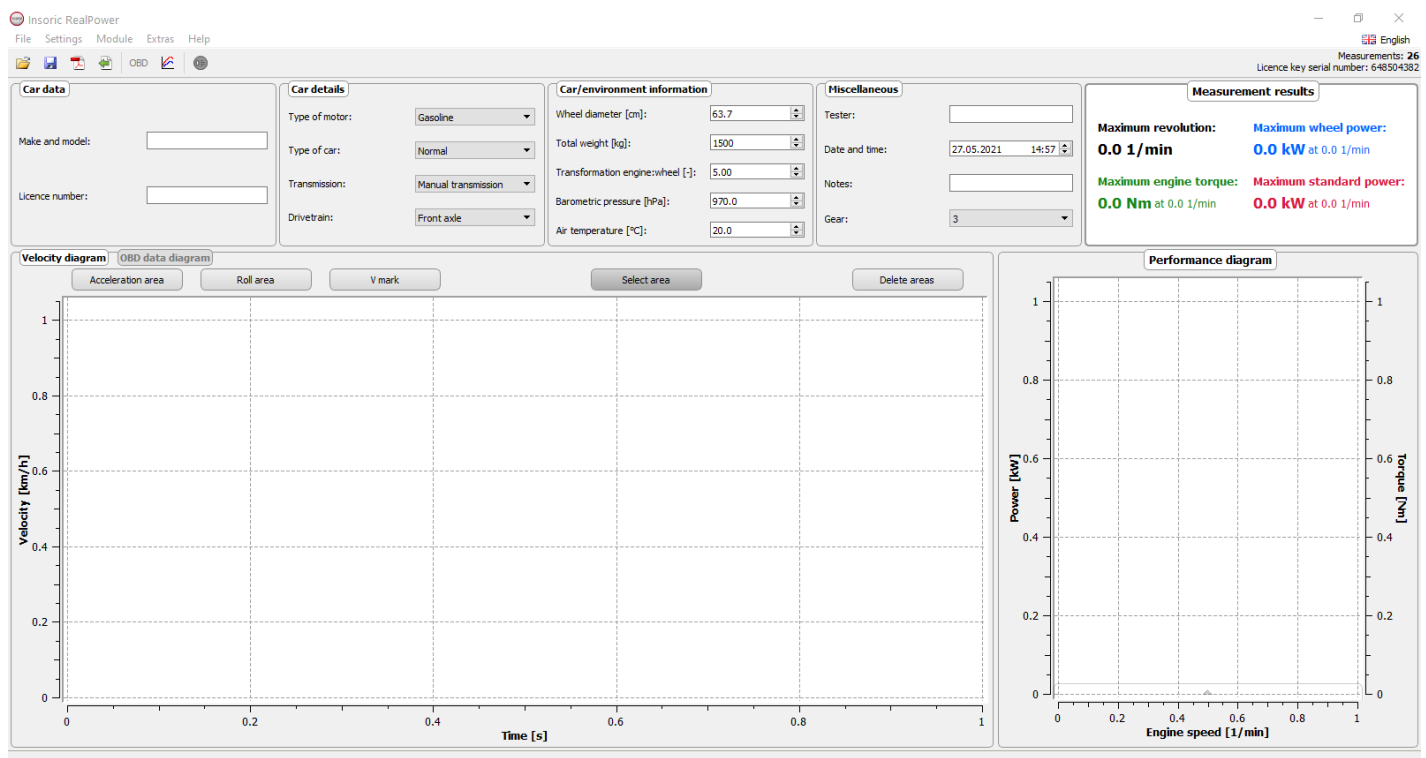
2.7.1. Starting the RealPower software

When the RealPower software is installed, a desktop shortcut is automatically created.

The shortcut is displayed as an icon.

To start the RealPower software you require the licence key (see Section 1.8). Plug the USB stick (see Section 1.3, item 10) on which the licence key is stored into an available USB port on your PC.

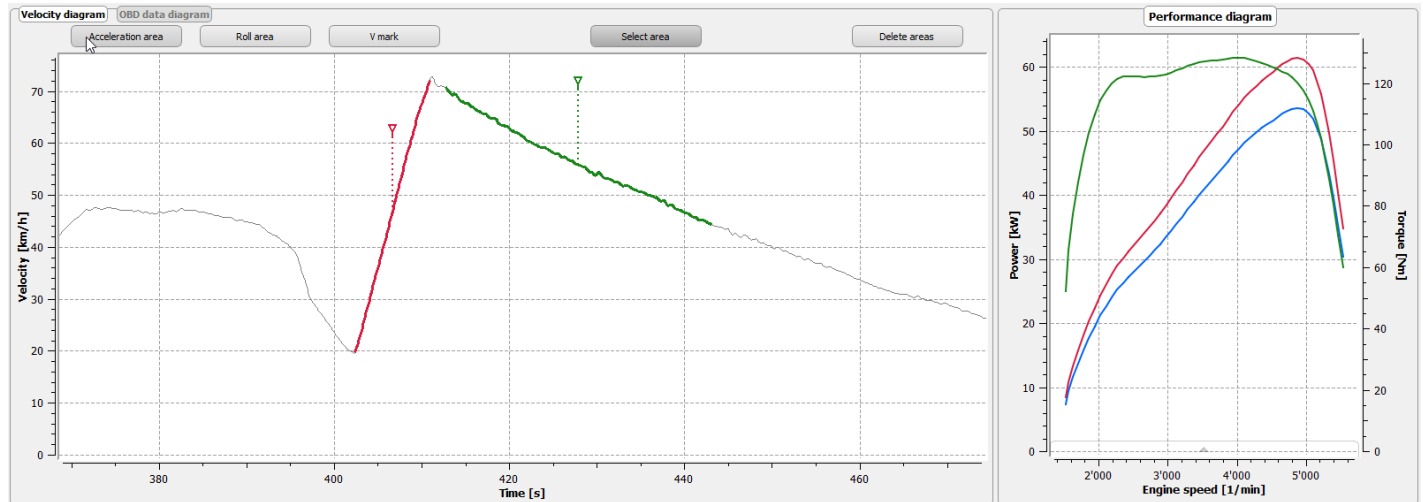
Double-clicking the program icon will then start the user interface of the RealPower software.



2.7.1.1. Size view diagrams > RealPower 2.0

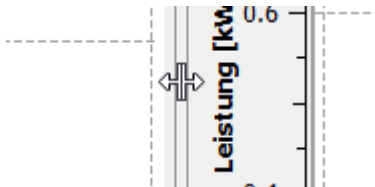
The views of the speed, OBD and power diagrams can be changed by moving the windows.

Standard view

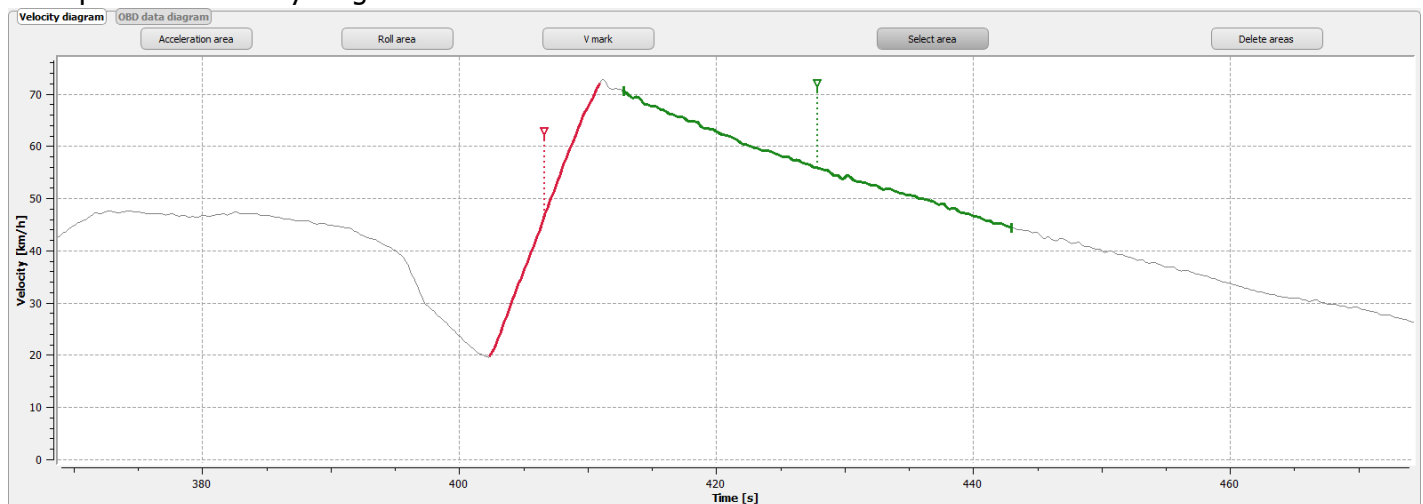


If you move the mouse pointer over the dividing line between the two graphic areas, the pointer symbol above the dividing line changes. the pointer symbol changes. By pressing and holding the left mouse button, the symbol will be snapped and the windows can be moved to the desired size. By releasing the mouse button the new setting is fixed.

Symbol for dragging the windows

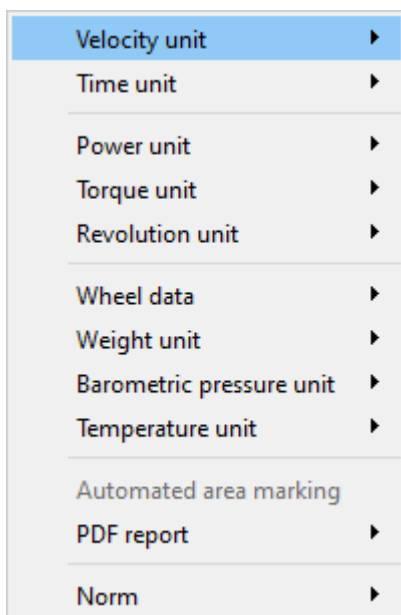
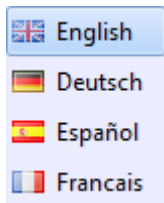


Example: View velocity diagram across the entire width

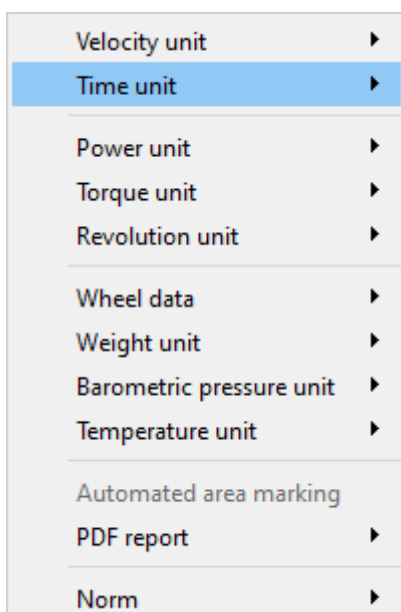
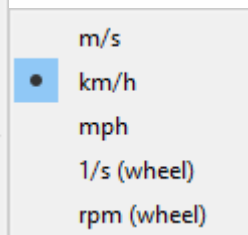


2.7.2. Entering basic settings

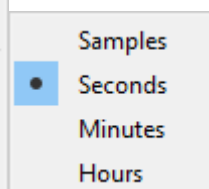
Go to the menu and set the desired language

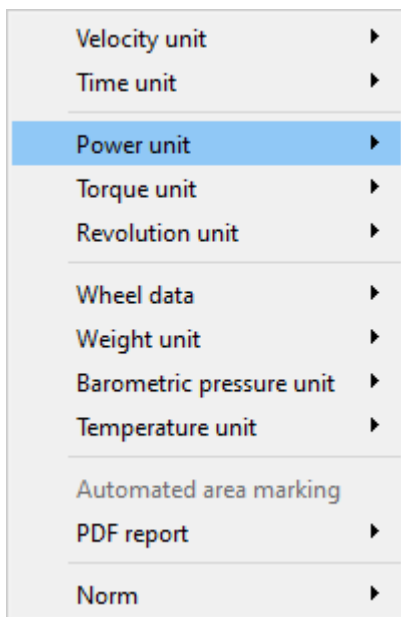


The menu option "**Settings**" > "**Velocity unit**" allows you to choose between m/s, km/h, mph or rpm.

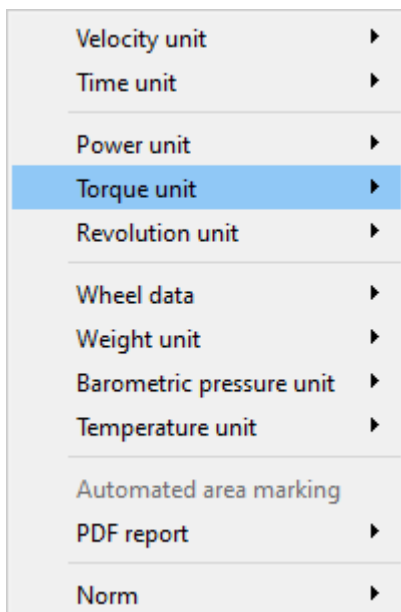


The menu option "**Settings**" > "**Time unit**" allows you to choose between Samples, Seconds, Minutes, Hours.

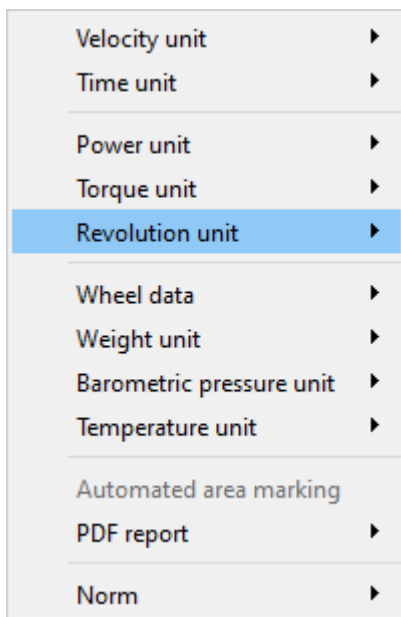




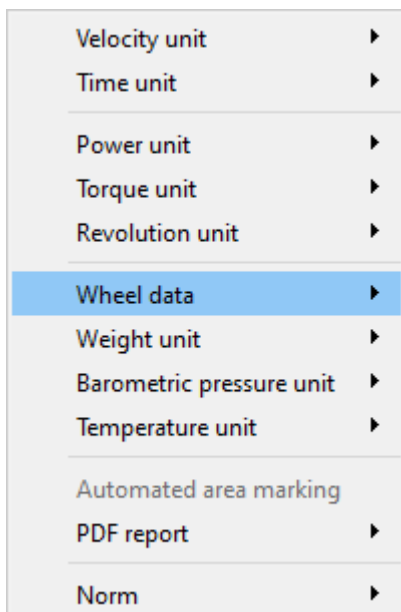
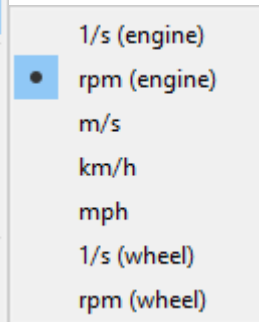
The menu option "**Settings**" > "**Power unit**" allows you to choose between kW, hp, PS, CV, ch, bhp.



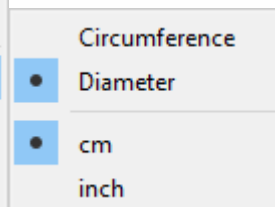
The menu option "**Settings**" > "**Torque unit**" allows you to choose between Nm and lbf ft.



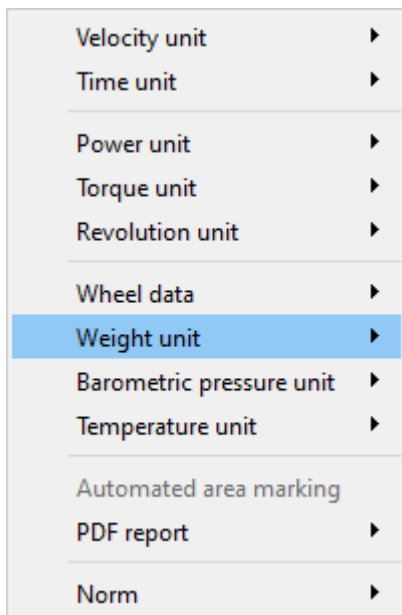
The menu option "**Settings**" > "**Revolution unit**" allows you to choose between 1/s and rpm (engine), ms, km/h, mph 1/s and rpm (wheel)



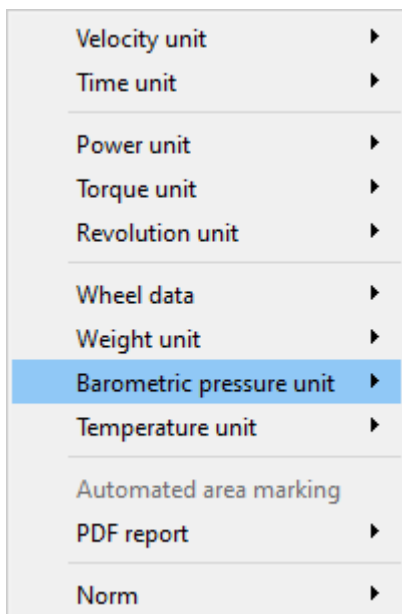
The option "**Wheel data**" allows you to specify the unit for the wheel dimensions.



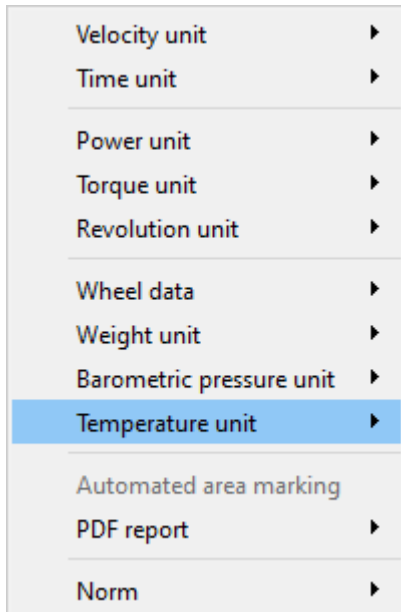
** The diameter of the wheel can be determined with the optionally available wheel measuring device (see chapter 2.6.2)*



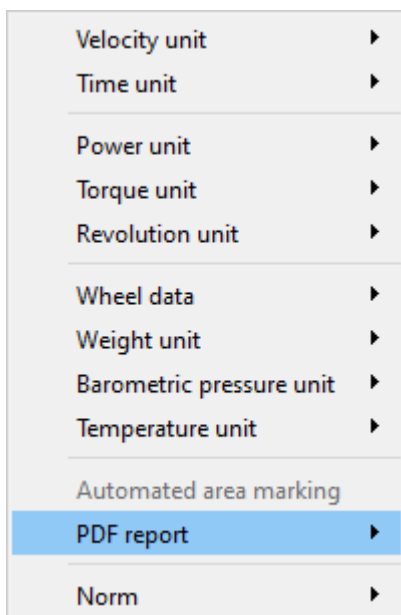
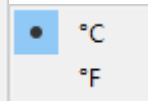
The menu option "**Settings**" > "**Weight unit**" allows you to choose between kg and lb.



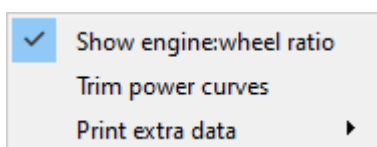
The menu option "**Settings**" > "**Barometric pressure unit**" allows you to choose between hPa and mbar.



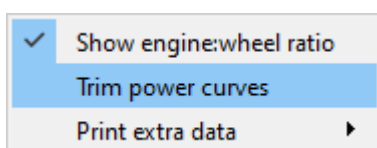
The menu option "**Settings**" > "**Temperature unit**" allows you to choose between °C and °F.



Using the option "**PDF report**" allows you to show the wheel ratio in the PDF file



Display translation in PDF



Also can the power curve be shortend towards the end zone

☒	Show engine:wheel ratio
☐	Trim power curves
☐	Print extra data ▶

Additional data in PDF print

☐	Velocity diagram
☐	Acceleration area
☐	Roll area

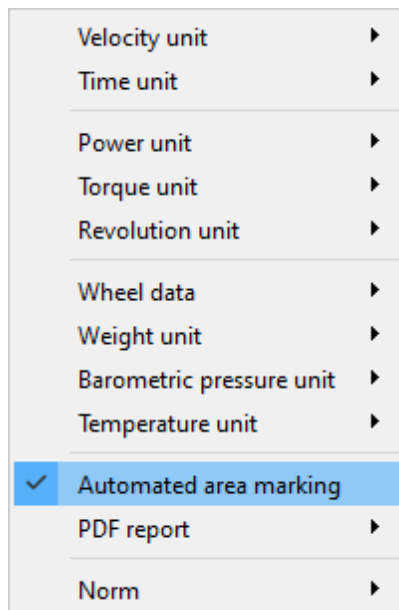
Data selection

Velocity unit	▶
Time unit	▶
Power unit	▶
Torque unit	▶
Revolution unit	▶
Wheel data	▶
Weight unit	▶
Barometric pressure unit	▶
Temperature unit	▶
Automated area marking	
PDF report	▶
Norm	▶

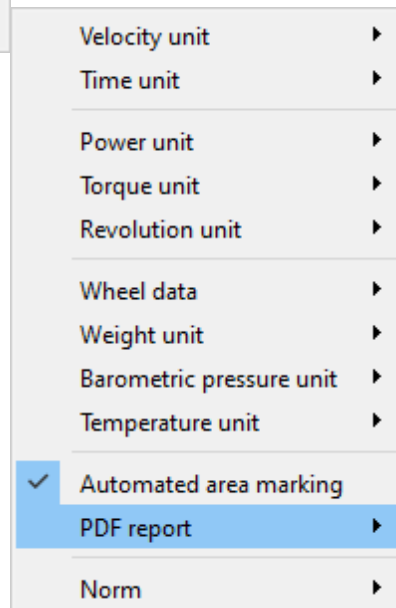
•	ECC
	DIN
	ISO
	SAE
	Temperature correction only
	None

The setting "**Norm**" is for calculating the adjustment and is preset. ECC, DIN, ISO, SAE or none

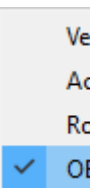
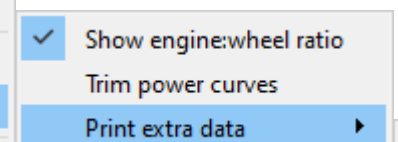
2.7.2.1. Advanced basic settings > RealPower 2.0



With menu item "**Automatic area marking**" the automatic marking of the acceleration and coasting phases (see chapter 2.7.5.2.1)



Via the "**Settings**" > "**PDF report**" selection Settings for additional displays and printouts are made



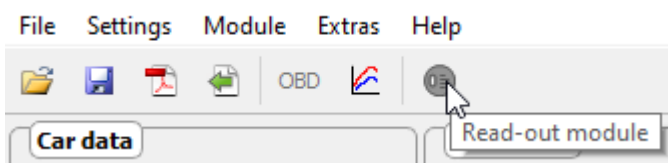
Velocity unit	▶	
Time unit	▶	
Power unit	▶	
Torque unit	▶	
Revolution unit	▶	
Wheel data	▶	• ECC
Weight unit	▶	DIN
Barometric pressure unit	▶	ISO
Temperature unit	▶	SAE
✓ Automated area marking		Temperature correction only
PDF report	▶	None
Norm	▶	

The setting "**Temperature correction only**" is to be used for vehicles with internal air pressure correction.

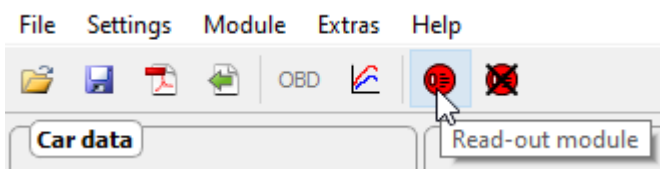
2.7.3. Reading the data from the RealPower module



Now connect the RealPower module to the PC using the USB lead supplied and switch it on.
The green "ON" LED should start flashing.

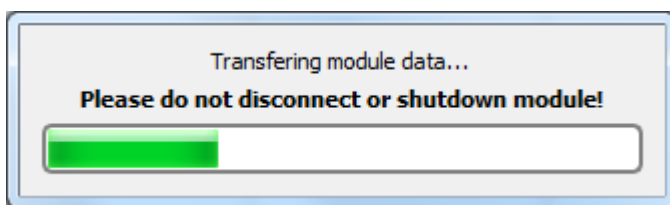


If the Icon **"Read-out module"** is greyed out, no module is connected to the USB port.

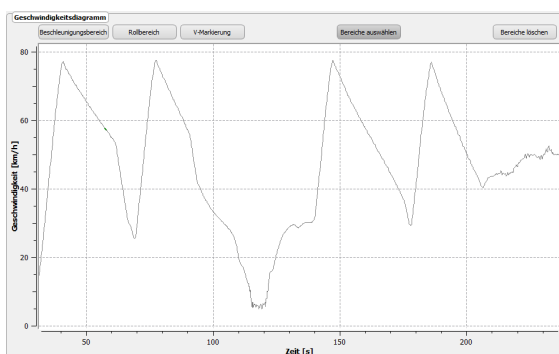


Activate the RealPower module by clicking the **"Read-out module"** button. The process of reading/transferring the data then starts.

A green progress bar appears in the bottom right corner of the application window.

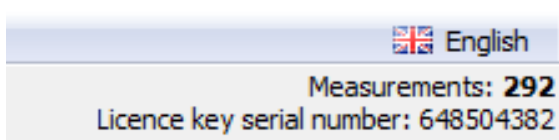


Progress bar



Once all the data has been successfully read from the RealPower module, the progress bar window is closed and the power traces recorded appear on the velocity diagram

If there are problems with data transfer, an error message appears.



After completion of data transfer, the RealPower software automatically elevated by one the number of remaining tests shown in the top right corner.

Choosing **"File" > "Save"** saves the data on your PC. The file name and where it is saved are always user-definable.

The data remains on the RealPower module even after data transmission



Clicking the **"Delete module data"** button completely and irretrievably deletes all data from the RealPower module memory

Before wiping the module memory, please make sure that you have saved the data on your PC.

2.7.3.1. Import OBD data >RealPower 2.0

With the OBD Import it is possible to merge a RealPower power measurement and data from the OBD interface bring together.

For the data acquisition and the transfer to the RealPower system is an OBD scanner, diagnostic system or a device suitable, that the OBD data and export it with a "**csv-file**".

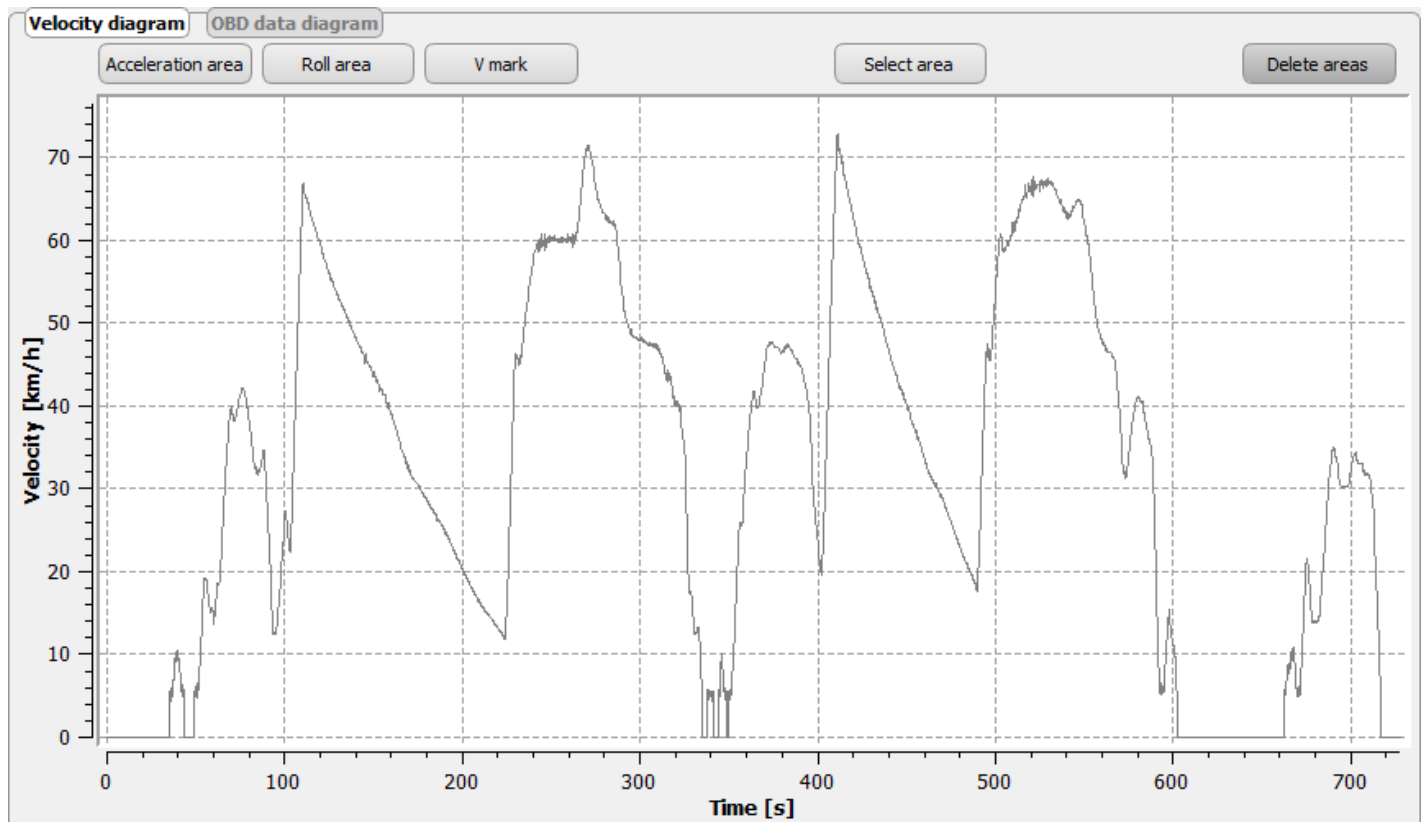
In addition to time and engine speed that must be recorded, four other OBD ID's can be recorded.

The power measurement with the RealPower module and the recording at the OBD interface must be done **simultaneously** and parallel to each other.

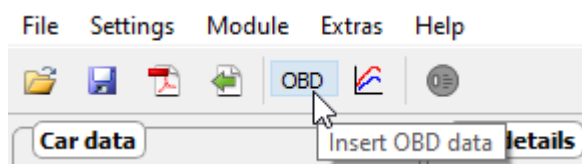
The merging and the synchronization of the measured data is done automatically by the RealPower software.

Read RealPower measurement

Before the OBD import the RealPower measurement must be read from the module



Open the OBD data import assistant in the menu with the "**OBD**" button.



Select and insert OBD file

Use the "**Search**" button to go to the csv data file you want to import. With the button "Open" the csv data file is imported into the wizard

OB data import wizard

OB data file

C:/Users/Public/Documents/Insoric RealPower Speed/Beispiele/Opel_Combo_1_OBD_.csv

Search

1.574257381920670033e+09	1.4610000000000000e+03	1.574257381998779058e+09	7.0000000000000000e+00
1.574257382014334202e+09	1.4637500000000000e+03	1.574257382030017853e+09	8.0000000000000000e+00
1.574257382061256886e+09	1.4710000000000000e+03	1.574257382076883554e+09	8.0000000000000000e+00
1.574257382092504263e+09	1.4785000000000000e+03	1.574257382123748302e+09	8.0000000000000000e+00
1.574257382139371872e+09	1.4907500000000000e+03	1.574257382154987812e+09	8.0000000000000000e+00
1.574257382170057058e+09	1.5010000000000000e+03	1.574257382201768398e+09	8.0000000000000000e+00
1.574257382217149973e+09	1.5167500000000000e+03	1.574257382232696533e+09	8.0000000000000000e+00
1.574257382264342546e+09	1.5302500000000000e+03	1.574257382279957771e+09	8.0000000000000000e+00
1.574257382294896126e+09	1.5522500000000000e+03	1.574257382342306137e+09	8.0000000000000000e+00
1.574257382358061790e+09	1.5672500000000000e+03	1.574257382373681545e+09	8.0000000000000000e+00
1.574257382389027119e+09	1.5767500000000000e+03	1.574257382420552492e+09	8.0000000000000000e+00
1.574257382436168909e+09	1.5867500000000000e+03	1.574257382451447725e+09	8.0000000000000000e+00
1.574257382482502699e+09	1.5902500000000000e+03	1.574257382498665333e+09	8.0000000000000000e+00

Selection

Time

Engine RPM

+

Import Cancel

Selection of OBD data

The **time** and **engine speed** from the OBD file are automatically placed on the upper two fields in the **selection**. With the + key further fields (max. 4) can be opened in the selection and additional OBD data can be assigned.

OBd data import wizard



OBd file

C:/Users/Public/Documents/Insoric RealPower Speed/Beispiele/Opel_Combo_1_OBD_.csv

Search

1.574257381920670033e+09	1.461000000000000000e+03	1.574257381998779058e+09	7.0000000000000000e+00
1.574257382014334202e+09	1.463750000000000000e+03	1.574257382030017853e+09	8.0000000000000000e+00
1.574257382061256886e+09	1.471000000000000000e+03	1.574257382076883554e+09	8.0000000000000000e+00
1.574257382092504263e+09	1.478500000000000000e+03	1.574257382123748302e+09	8.0000000000000000e+00
1.574257382139371872e+09	1.490750000000000000e+03	1.574257382154987812e+09	8.0000000000000000e+00
1.574257382170057058e+09	1.501000000000000000e+03	1.574257382201768398e+09	8.0000000000000000e+00
1.574257382217149973e+09	1.516750000000000000e+03	1.574257382232696533e+09	8.0000000000000000e+00
1.574257382264342546e+09	1.530250000000000000e+03	1.574257382279957771e+09	8.0000000000000000e+00
1.574257382294896126e+09	1.552250000000000000e+03	1.574257382342306137e+09	8.0000000000000000e+00
1.574257382358061790e+09	1.567250000000000000e+03	1.574257382373681545e+09	8.0000000000000000e+00
1.574257382389027119e+09	1.576750000000000000e+03	1.574257382420552492e+09	8.0000000000000000e+00
1.574257382436168909e+09	1.586750000000000000e+03	1.574257382451447725e+09	8.0000000000000000e+00
1.574257382482502699e+09	1.590250000000000000e+03	1.574257382498665333e+09	8.0000000000000000e+00

Selection

Time

Engine RPM

Extra 1

+

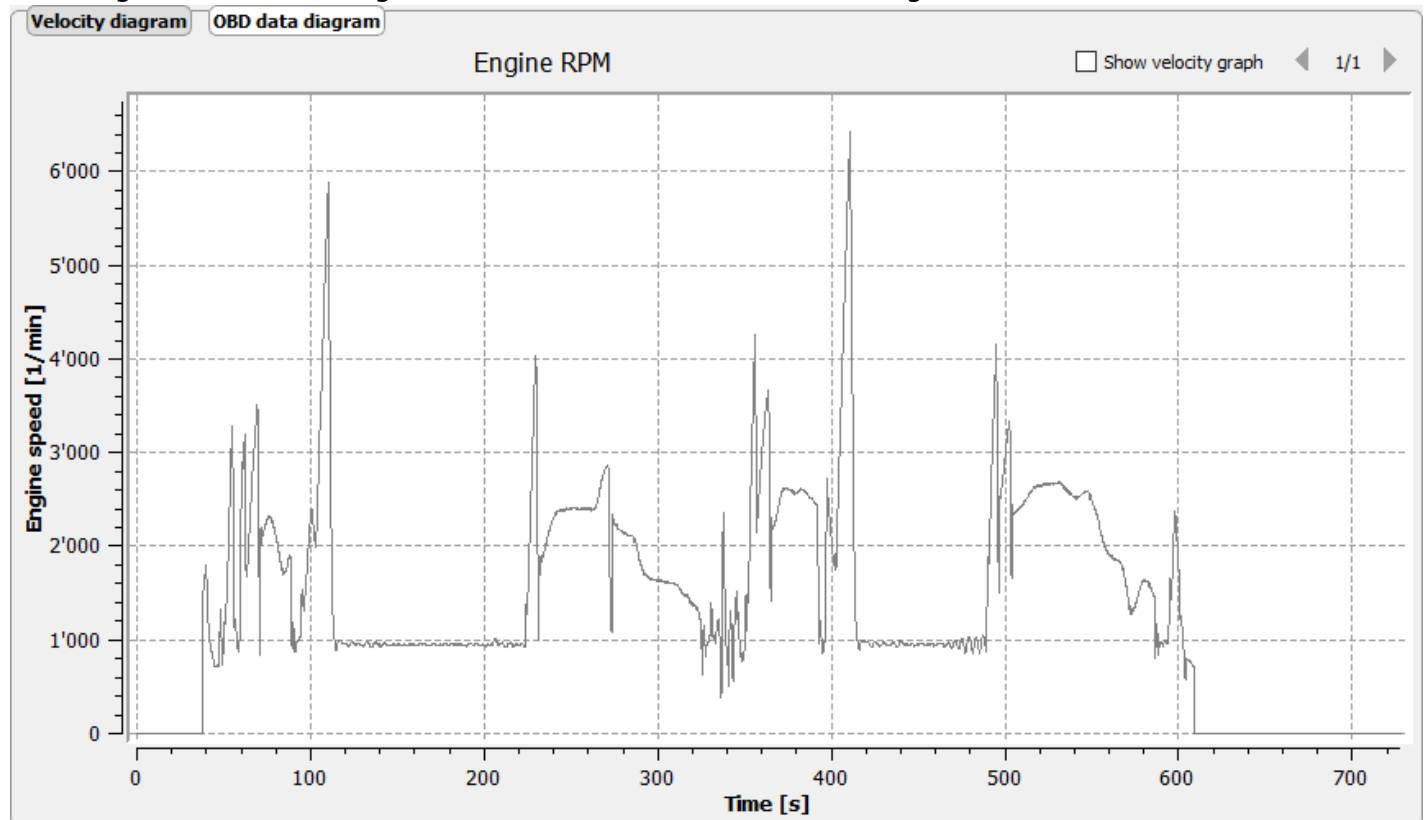
Import

Cancel

Import into RealPower measurement

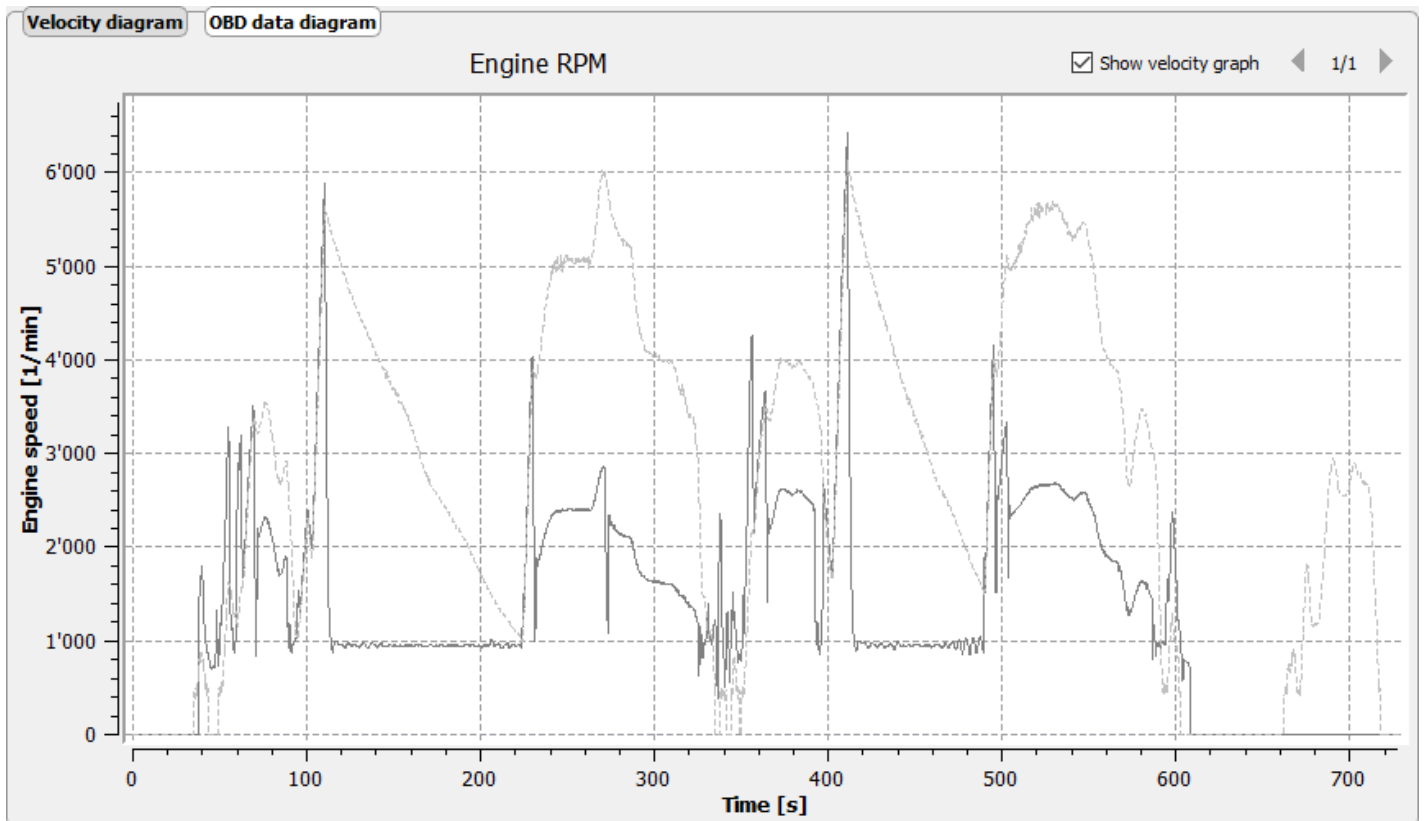
With the button **"Import"** you insert the OBD data into the **OBD data diagram**.

The previously selected data can be selected with the two arrow keys (right) and made visible in the OBD diagram. The data designation is indicated as text above the diagram.



of the measured data

With the selection **"Display velocity graph"** the data of the RealPower module from the Velocity graph is displayed overlaid.

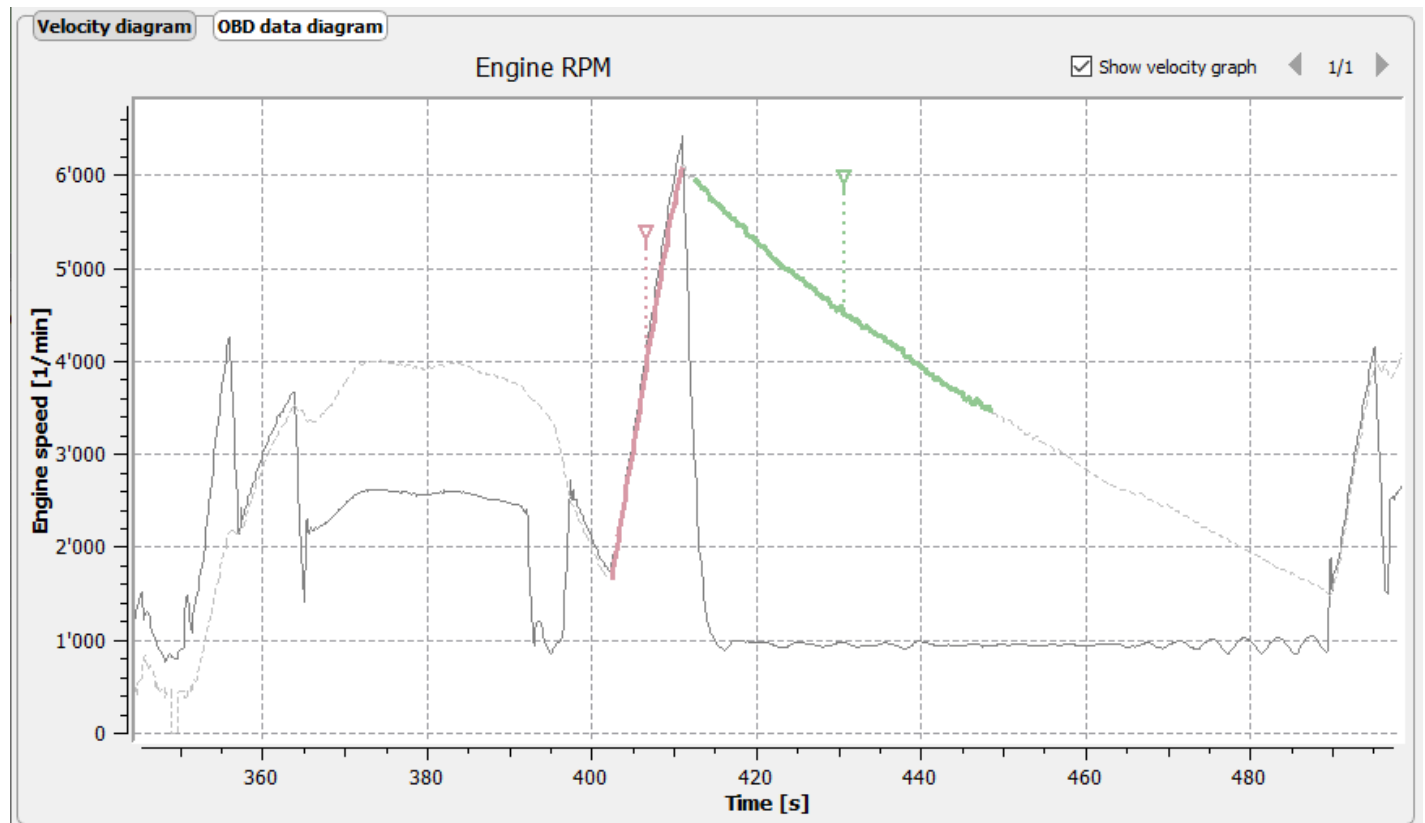


Marking and evaluation

All marked acceleration and roll ranges in the speed diagram are displayed in color.

As in the velocity diagram, the measurement curves in the OBD data diagram can be enlarged for the required scroll wheel and moved with the left mouse button.

Via the menu "**Settings**" > "**PDF Outputs**" the selection for output and print is done.



2.7.4. Clear RealPower module memory

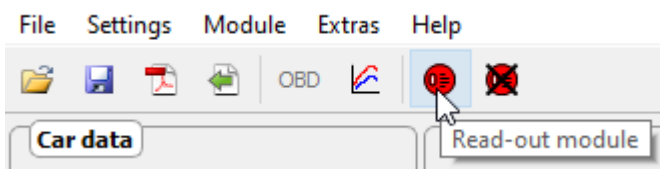


Now connect the RealPower module to the PC using the USB cable supplied with the module and switch it on.

Green LED "ON" flashes in operating mode.

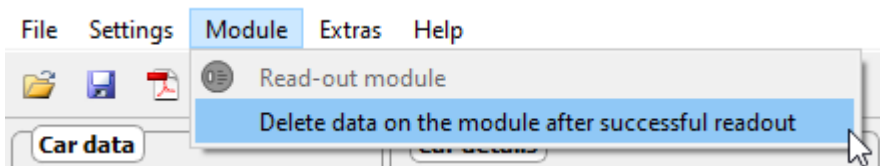
Delete module memory manually

With the icon **"Delete module data"** the data memory on the RealPower- module is completely and irrevocably deleted.



Delete module memory automatically

Under menu **"Module" > "Delete data on the module after successful readout"** the data are automatically deleted from the module memory if the module was successfully read out. Activate this function only if you are sure that you do not need that you do not need the data in the module memory



Before emptying the module memory, please make sure that you have saved the data on your PC.

2.7.5. Analysing the results

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2.7.5.1. Entering parameters

Now you should enter the parameters already mentioned in Section 2.6.1 in the RealPower software program. *If you have completed the "Data check-list", you should have all the information to be entered manually available at a glance.*

Car data

Car data

Make and model: Opel Combo 1.4

Licence number: ZH xxxx

In this window you enter the make, model and licence number of the car. Those details will appear on the test certificate later on.

Make and model

Licence number

Car details

Car details

Type of motor: Gasoline

Type of car: Normal

Transmission: Manual transmission

Drivetrain: Front axle

In this window, you select the type of motor, vehicle, transmission and drive. *The options are selected from the drop-down lists.*

Type of motor Car documents

Type of car Car documents

Transmission Car documents

Drivetrain Car documents

Car/environment informations

Car/environment information

Wheel diameter [cm]: 63.7

Total weight [kg]: 1580

Transformation engine:wheel [-]: 9.25

Barometric pressure [hPa]: 970.0

Air temperature [°C]: 20.0

In this window you enter the vehicle parameters and the environment informations during the road test.

Wheel diameter Wheel measuring device *

Total weight Car documents: vehicle unladen weight ¹
+weight of all vehicle occupants

Transmission ratio Car documents or by means of

V mark (see Section 2.7.4.3)

Barometric pressure Barometer

Air temperature Thermometer

¹ For vehicles registered from 1995 onwards, the vehicle unladen weight stated in the registration documents usually equates to the weight of the vehicle with the fuel tank 90 % full plus the weight of the driver (75 kg). For vehicles

registered before 1995, the vehicle unladen weight is usually only the weight of the vehicle with the fuel tank 90 % full.
** Optionally available for RealPower Dyno systems*

Miscellaneous

Miscellaneous

Tester: Max Muster

Date and time: 06.07.2011 13:30

Notes: Fahrzeugdaten Opel 100KW

Gear: 2

In this window you specify the name of the tester, date and time of the test and other details of the road test or the vehicle

Name tester
Date and time of the measurement
Notes (free text)
Gear at measurement*

*The gear selected during the acceleration phase of the road test.

Parameters for X- and Y-axis in the power diagram

Velocity unit

Time unit

Power unit

Torque unit

Revolution unit

Wheel data

Weight unit

Barometric pressure unit

Temperature unit

Automated area marking

PDF report

Norm

The parameters for the X axes can be set on the **"Settings > Time unit"** menu

The time on the X axis can be shown in samples, seconds, minutes or hours.

Samples

Seconds

Minutes

Hours

Velocity unit

Time unit

Power unit

Torque unit

Revolution unit

Wheel data

Weight unit

Barometric pressure unit

Temperature unit

Automated area marking

PDF report

Norm

The parameters for the X axes can be set on the **"Settings > Velocity unit"** menu

The unit for the Y axis can be set to m/sec, km/h, 1/s wheel (wheel revolutions per second or minute)

m/s

km/h

mph

1/s (wheel)

rpm (wheel)

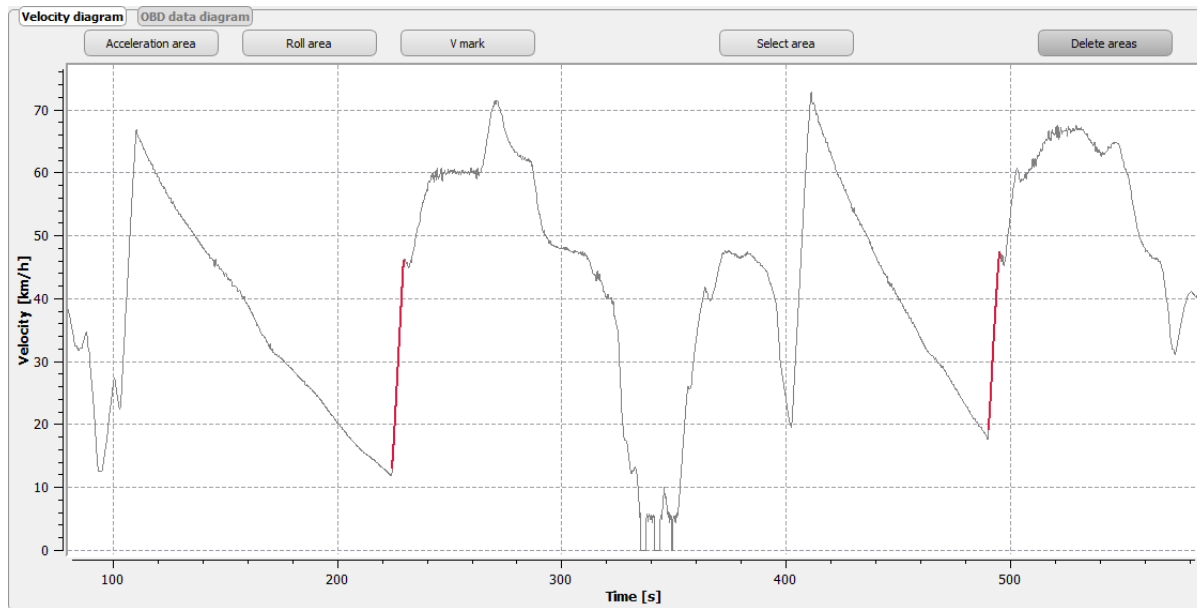
2.7.5.2. Marking the acceleration and roll areas

So that the power can be calculated, you have to mark an **acceleration area** and a **roll area** on the velocity diagram.

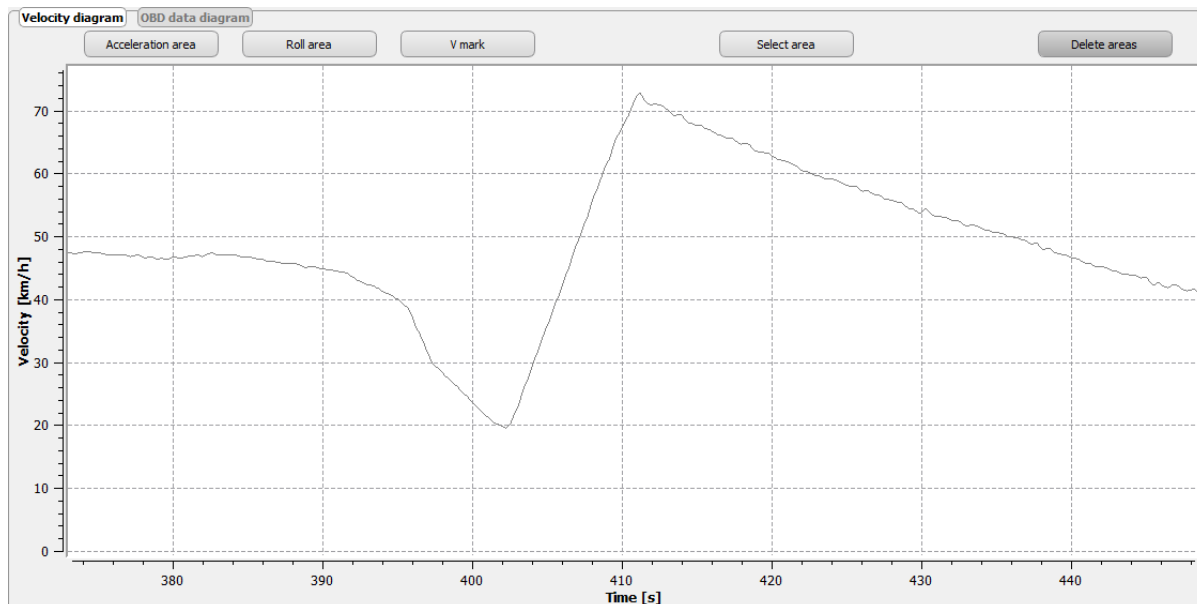
Zoom function

Use the zoom function to make the selected diagram more clearly laid out and therefore easier to mark. By using the mouse wheel it is possible to adjust the zoom grade.

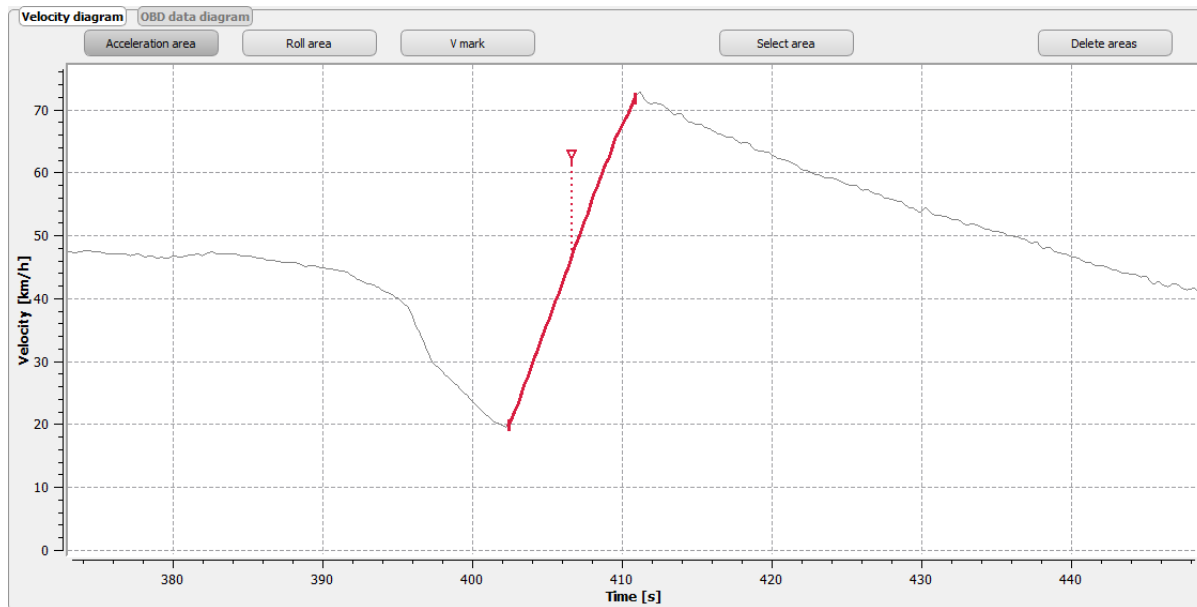
Normal view



Zoom area



Marking the acceleration area



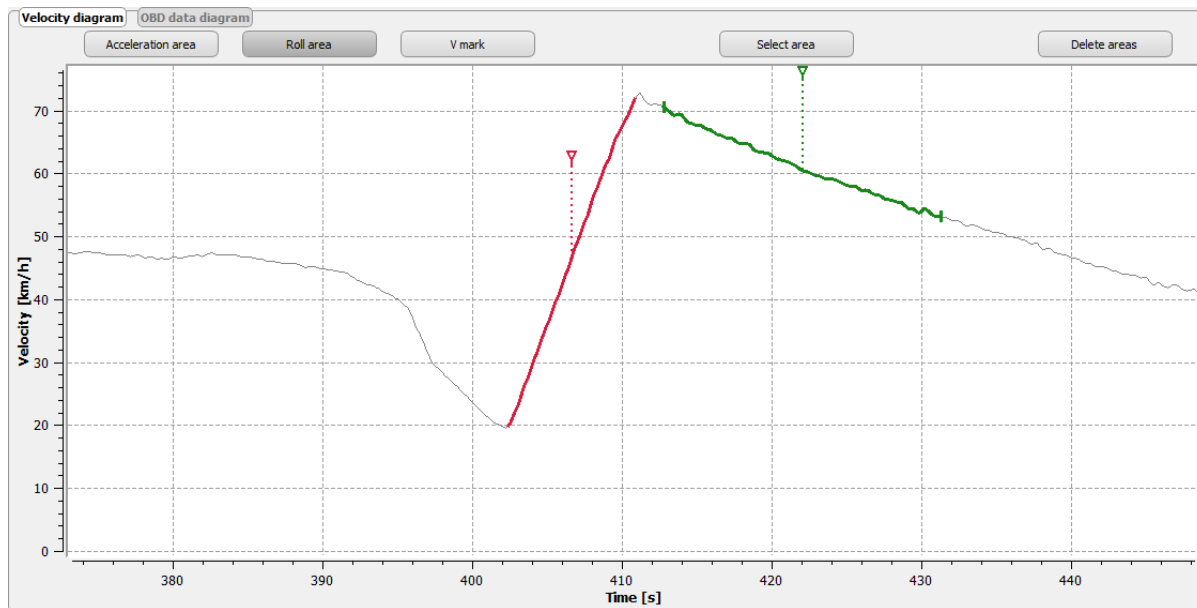
Now click the **"Acceleration area"** button on the **"velocity diagram"** menu. Position the cursor (cross-hairs) at the start of the acceleration area you wish to mark and click the left mouse button to confirm that point. Now position the cursor at the end of the section you wish to mark and left-click with the mouse again. The acceleration area is now shown coloured in red. That completes the marking procedure.

Alternatively, you can - Doppelklick auf die linken Maustaste - click the area you wish to mark with the central mouse button or the mouse wheel. The area will then be marked in red automatically.

If an area cannot be set automatically, this is indicated by means of a red symbol at the mouse pointer!

Please note that the selected section should be as close as possible to a straight line without zig-zags. The direction in which the gradient is marked (i.e. from top to bottom or from bottom to top) is of no consequence.

Marking the roll area



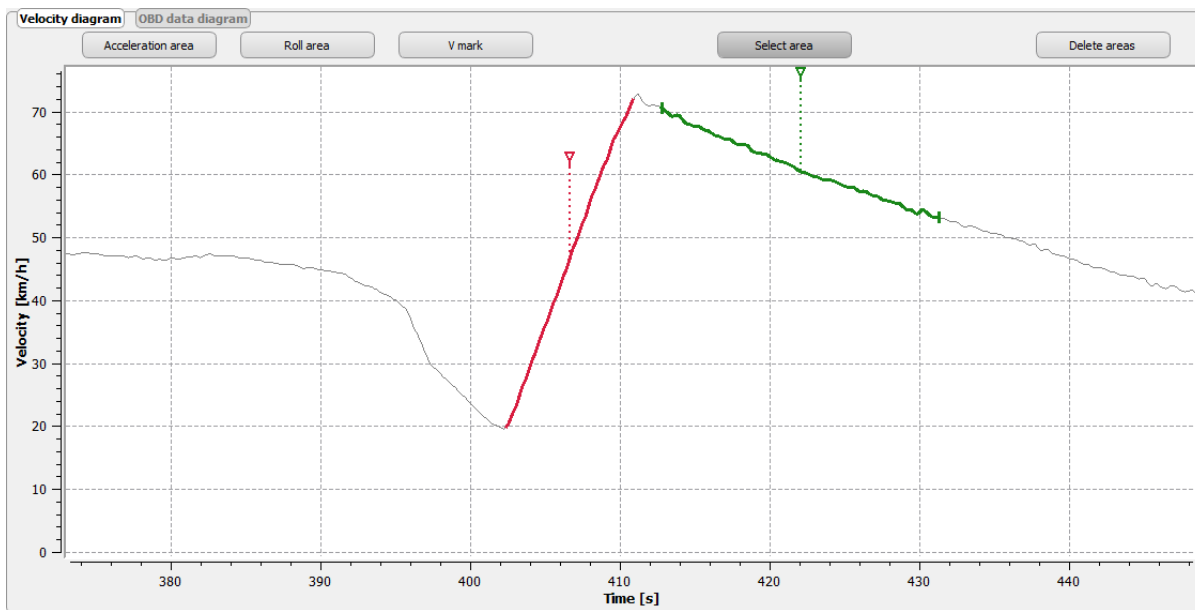
Now click the **"Roll area"** button on the **"velocity diagram"** menu. Position the cursor (cross-hairs) at the start of the roll area you wish to mark and click the left mouse button to confirm that point. Now position the cursor at the end of the section you wish to mark and left-click with the mouse again. The roll area is now shown coloured in green. That completes the marking procedure.

Alternatively, you can - Doppelklick auf die linken Maustaste - click the area you wish to mark with the central mouse button or the mouse wheel. The area will then be marked in green automatically.

If an area cannot be set automatically, this is indicated by means of a red symbol at the mouse pointer!

Please note that the selected section should be as close as possible to a straight line without zig-zags. The direction in which the gradient is marked (i.e. from top to bottom or from bottom to top) is of no consequence.

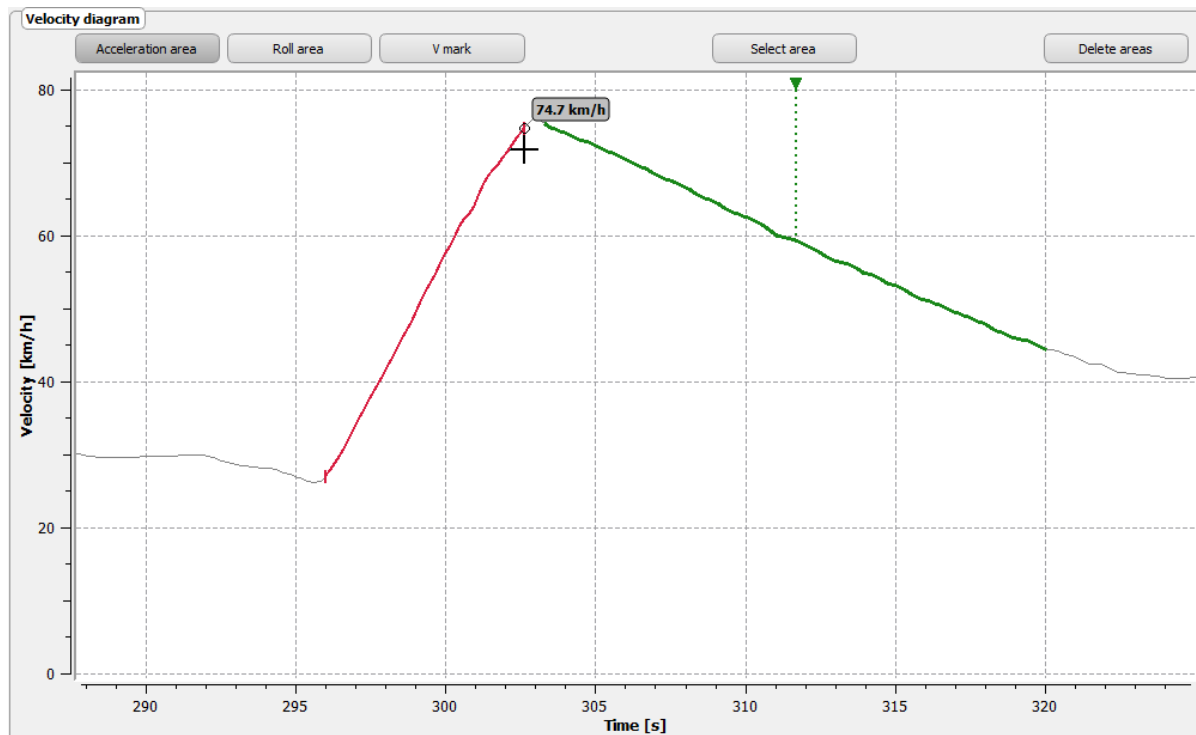
Marked areas



A red indicator points on the marked area, showing that the area is included in calculations. Marked areas can be edited afterwards, using the **editing function**.

A green indicator points on the marked area, showing that the area is included in calculations. Marked areas can be edited afterwards, using the **editing function**.

Edit marked areas



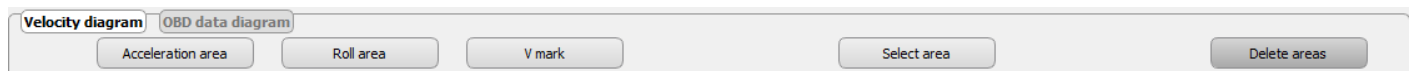
Select the **"Acceleration area"** or the **"Roll area"** button depending on the area you want to edit. Then use the left mouse button to click on the side of the marked area, depending on which end you want to edit. The end can then be edited. You can fix the end by clicking the left mouse button again. You can interrupt the editing by clicking the right mouse button.

Selecting the acceleration and roll areas

Insoric RealPower allows you to select individual acceleration and roll areas.

To do so, click the **"Select areas"** button on the **"velocity diagram"** menu. Then select the acceleration and roll areas to be used for the analysis by positioning the cursor (cross-hairs) on the desired sections and clicking the left mouse button to confirm in each case. After selection (cursor changes to hand), the selected gradients are highlighted, i.e. shown in **bold**.

Removing incorrectly marked areas

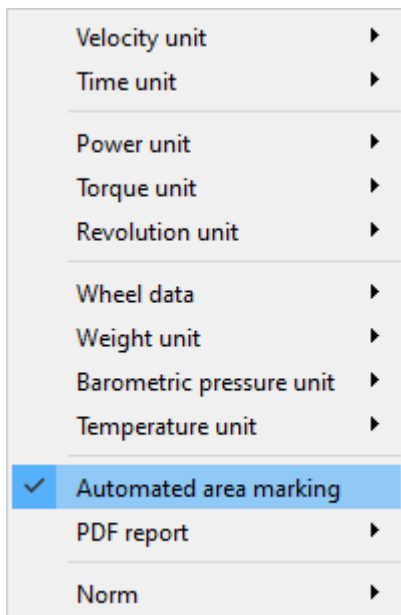


Incorrectly marked diagram areas can be unmarked by clicking the **"Delete areas"** button.

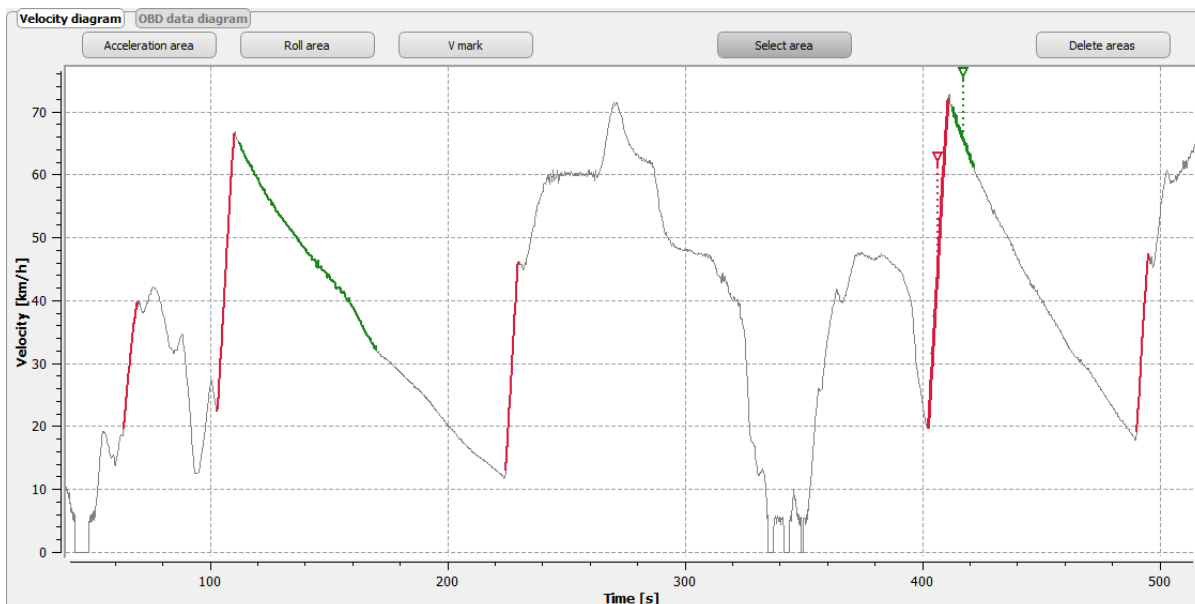
The cursor then changes into a hand symbol. Clicking the incorrectly marked gradient unmarks it.

2.7.5.2.1. Automatic range marking > RealPower 2.0

Automatically mark acceleration and rolling areas

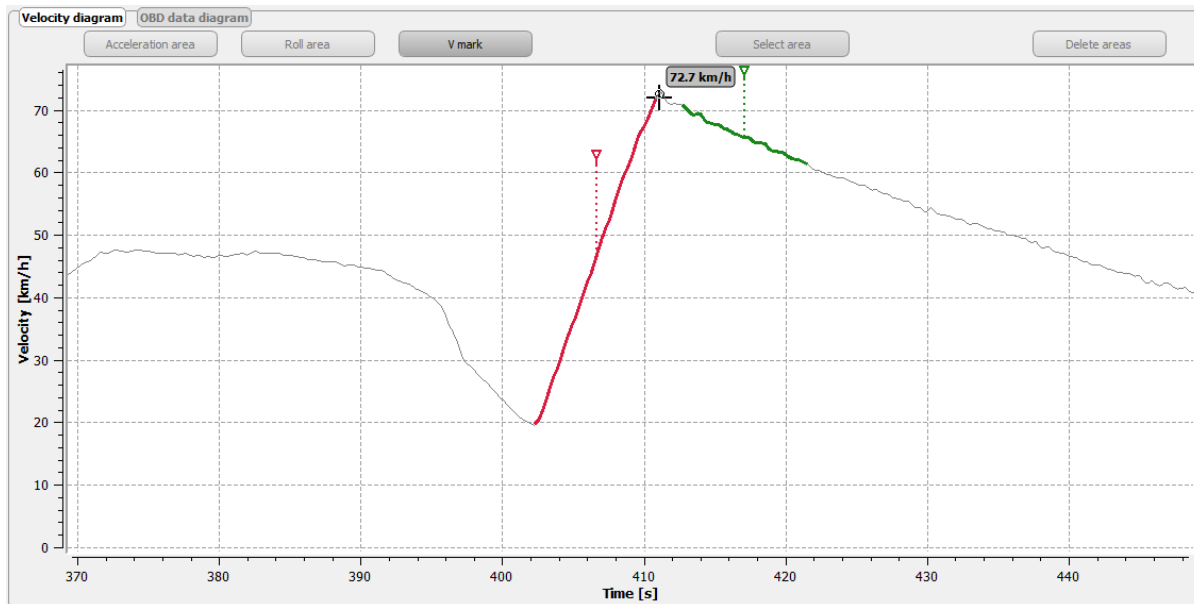


If **"Automatic range marking"** is selected under **"Settings"** by the software are the acceleration and rolling areas recognized by the software are automatically marked. With the button **"Select ranges"** the acceleration and roll range to be calculated is selected. that are to be calculated.
 If this function is switched off, the ranges must be marked manually.



2.7.5.3. V mark

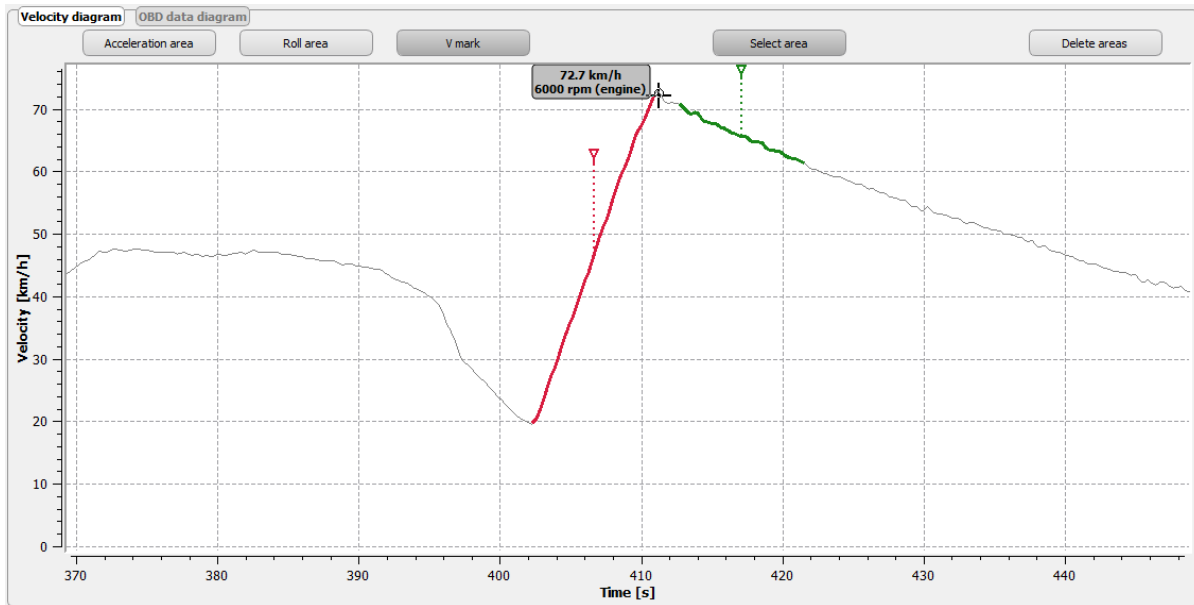
The V mark is used to determine the transmission ratio between engine and wheel **if it is not known**.



The V mark function allows you to specify the relationship between vehicle speed and engine revolution at various points along the acceleration gradient (at intervals of 1/10 of a second). When you click the V mark button, a small square appears on the diagram. That square can be moved to any position along the diagram. As you do so, the road speed measured every 1/10 of a second is shown. If you know the engine speed for any of the measured road speeds, you move the mark to that point and left-click to fix it on the velocity diagram.

A small dialog box with the title 'rpm (engine) at 72.7 km/h'. It contains a text input field with the value '6000'. Below the input field are two buttons: 'OK' and 'Cancel'.

Then a window automatically opens for you to enter the engine revolution that was shown on the rev counter when the car was travelling at the road speed you have just marked on the diagram.



After you have entered the engine revolution, the engine-to-wheel transmission ratio is automatically calculated and shown in the "Transmission ratio (engine:wheel) [-]:" window.

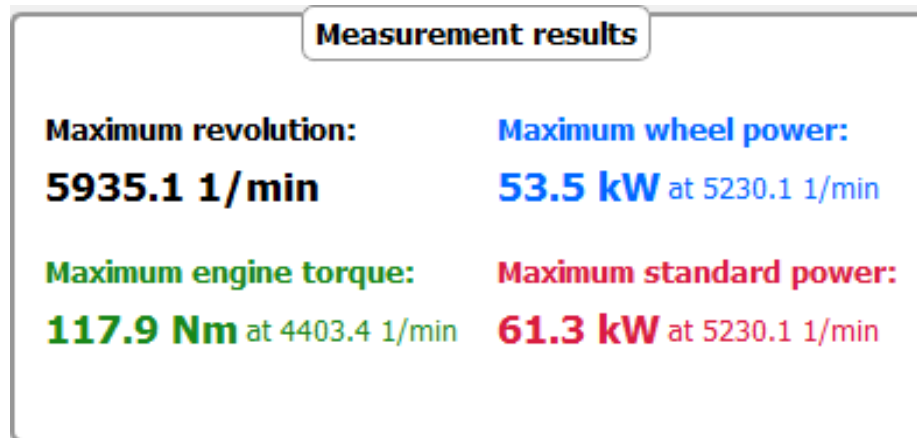
Transformation engine:wheel [-]:

*If the V mark/engine revolution is **not** specified, the transmission ratio for the gear in which the road test was carried out must be entered directly in the "Car/environment informations" & "Transmission ratio (engine:wheel) [-]:" window.*

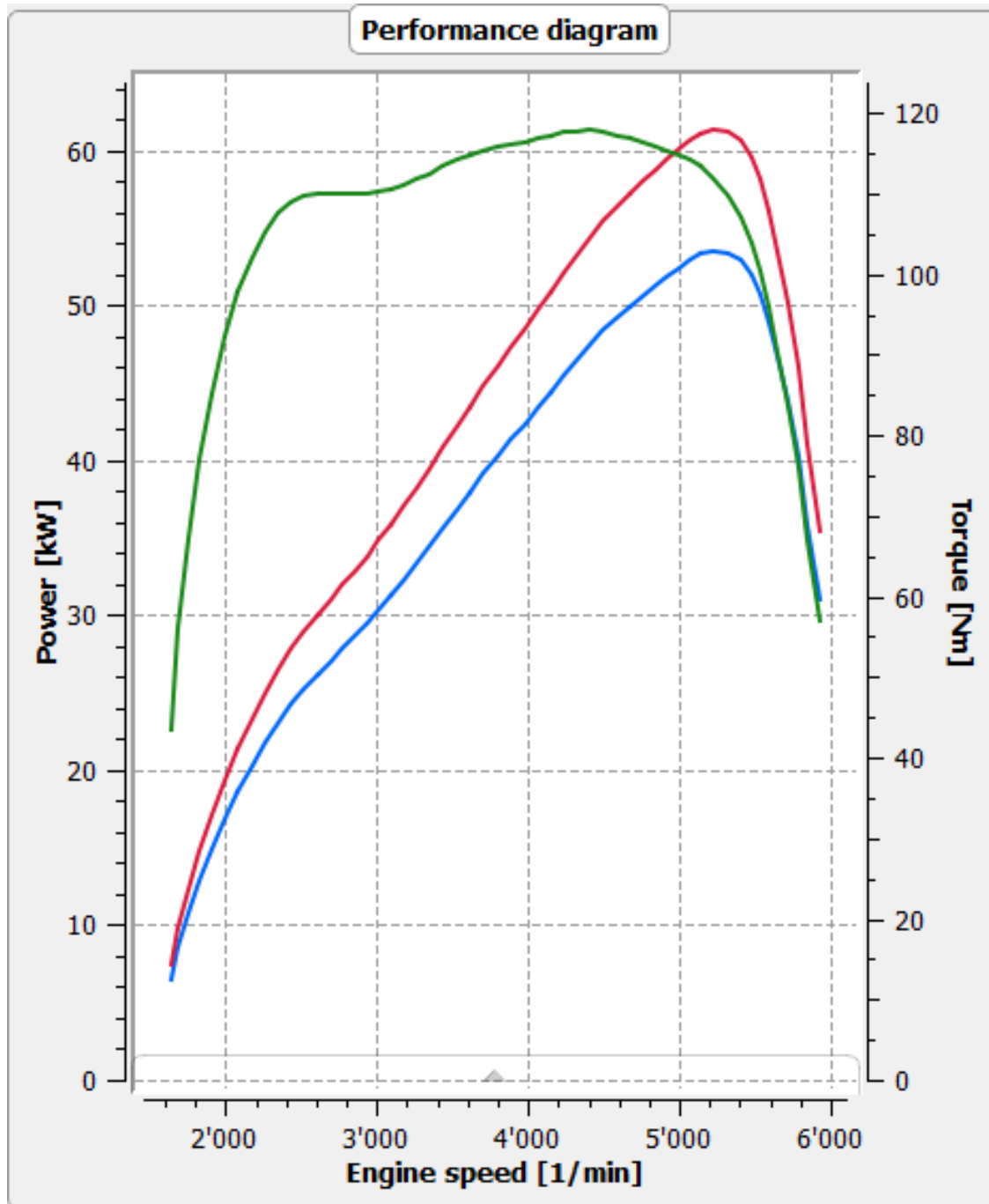
The details of the transmission ratios can be found in the owner's manual for the vehicle or the manufacturer's technical documentation.

2.7.5.4. Displaying the measurement results

If the vehicle-specific parameters and the acceleration and roll areas have been correctly specified, the performance figures are now shown as maximum levels ...



... and as curves on the performance diagram.



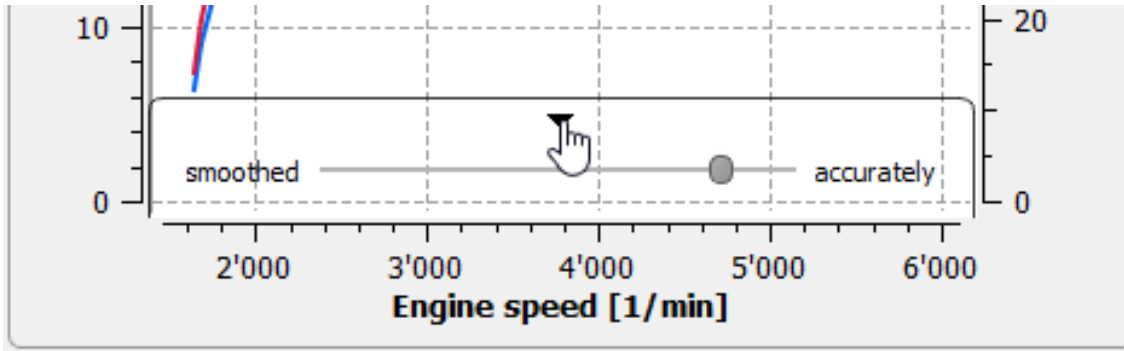
2.7.5.4.1. Smoothing controller > RealPower 2.0

The smoothing controller can be used to display the measurement curve in different sensitivity levels. This function is used when there are many waves in the course of the power curves and these disturb the overall picture of the measurement.

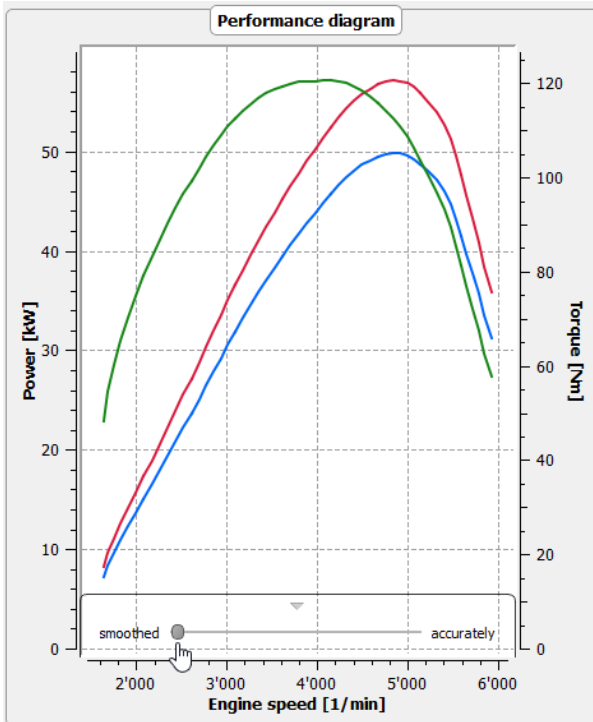
In the center position, the controller is in its default setting.

High sensitivity = right, lower sensitivity = left.

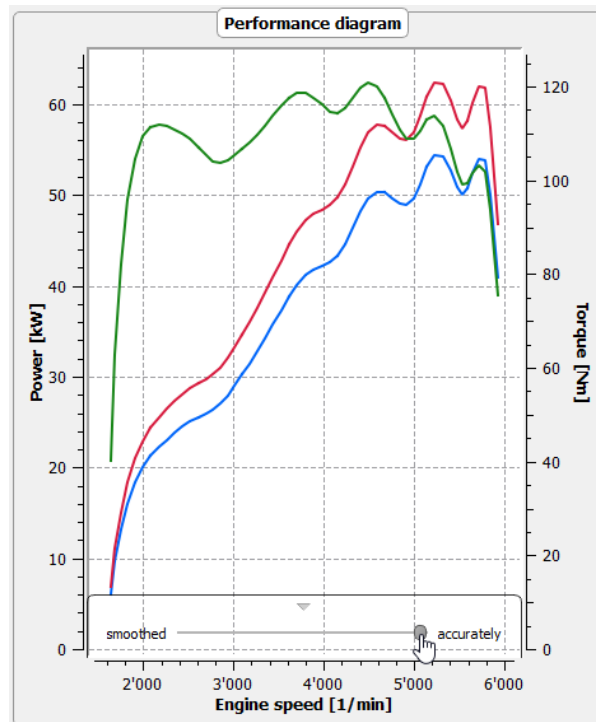
Using the controller outside of its center position may cause small +/- deviations in the measurement result.



Low sensitivity



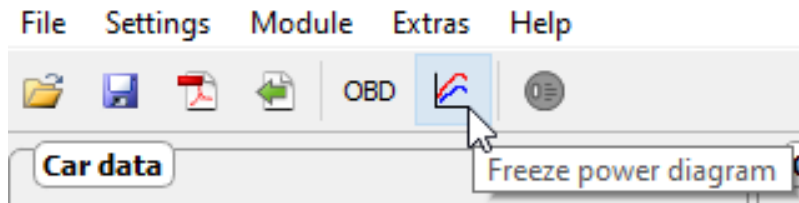
High sensitivity



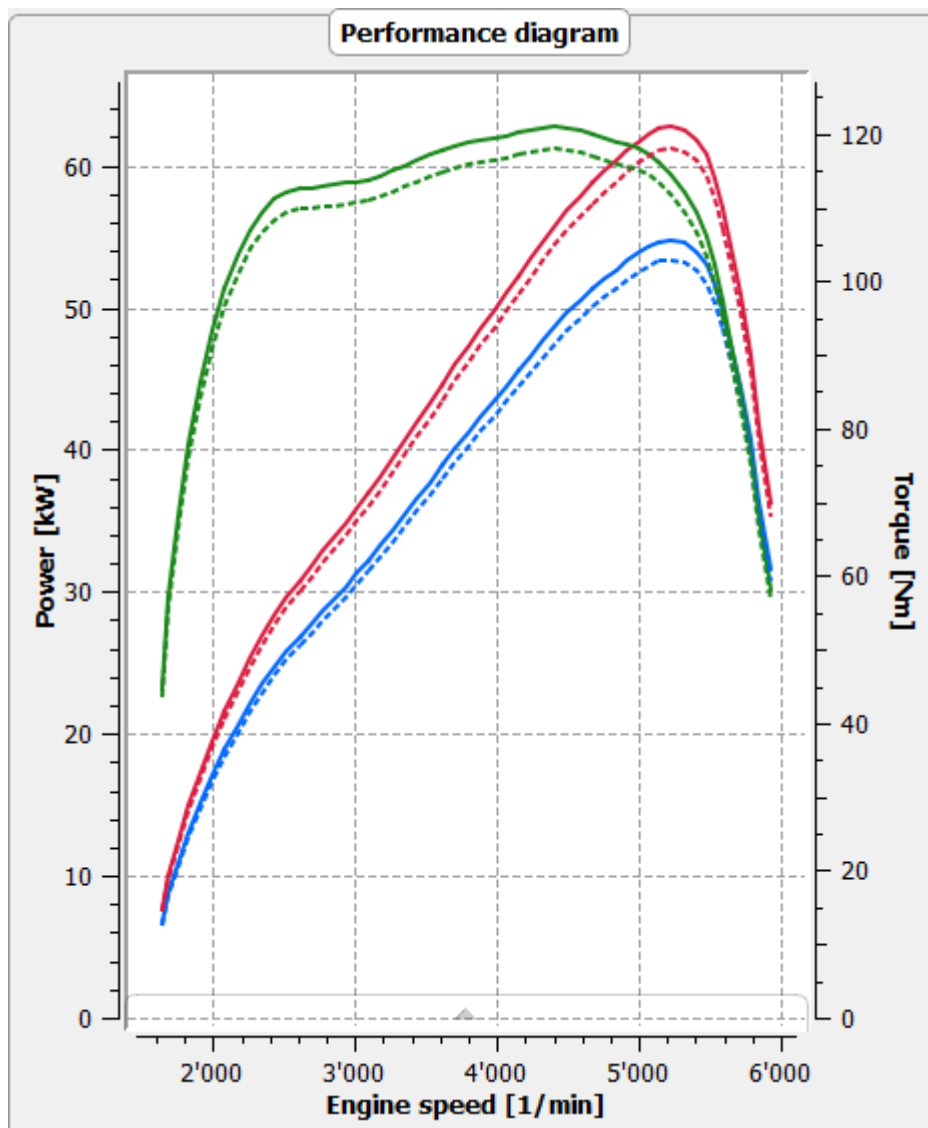
2.7.5.5. Freezing the power diagram

After analysing the data from a road test, the power curves can be fixed (frozen) on the performance diagram.

This function is suitable for comparing the power curves from two different tests. To do so, first click the Freeze power diagram button.



Then open a different, previously saved test. The performance diagram then shows the frozen test with broken lines and the new test opened with unbroken lines. In that way, two different sets of measurement results can be compared with one another.

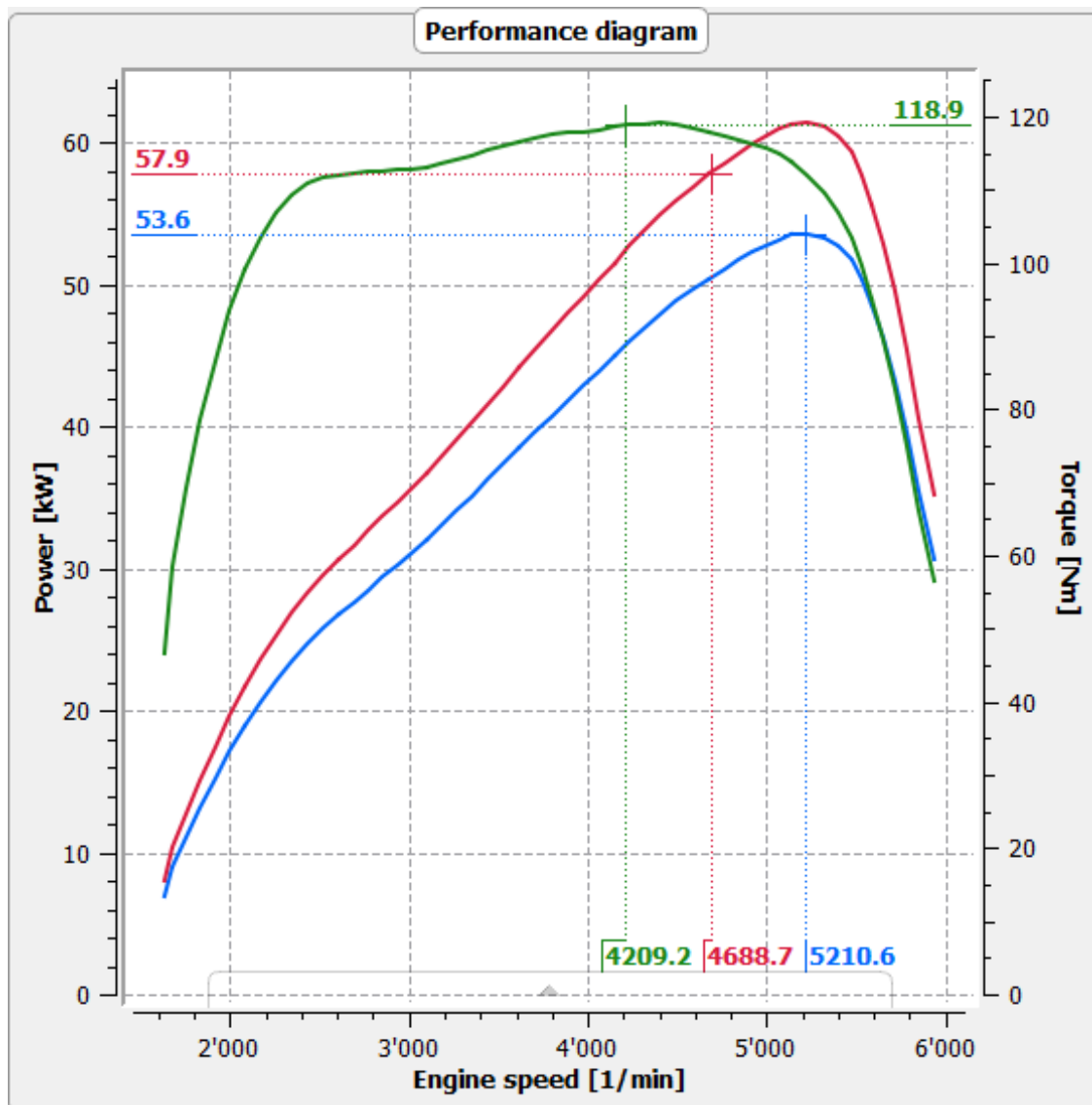


2.7.5.6. Evaluation of the performance chart

Move the cursor across the performance chart. While moving across a performance curve, the cursor will turn into a hand symbol and the curve will be highlighted. The performance curve can now be selected by using the left mouse button. A cross with dashed reference lines and the performance data of its current position will appear. The cross is fully adjustable and can be fixed by using the left mouse button. By using the left mouse button again, the cursor can be unfixed.

The reference lines and the performance data can be switched off by using the right mouse button on a curve.

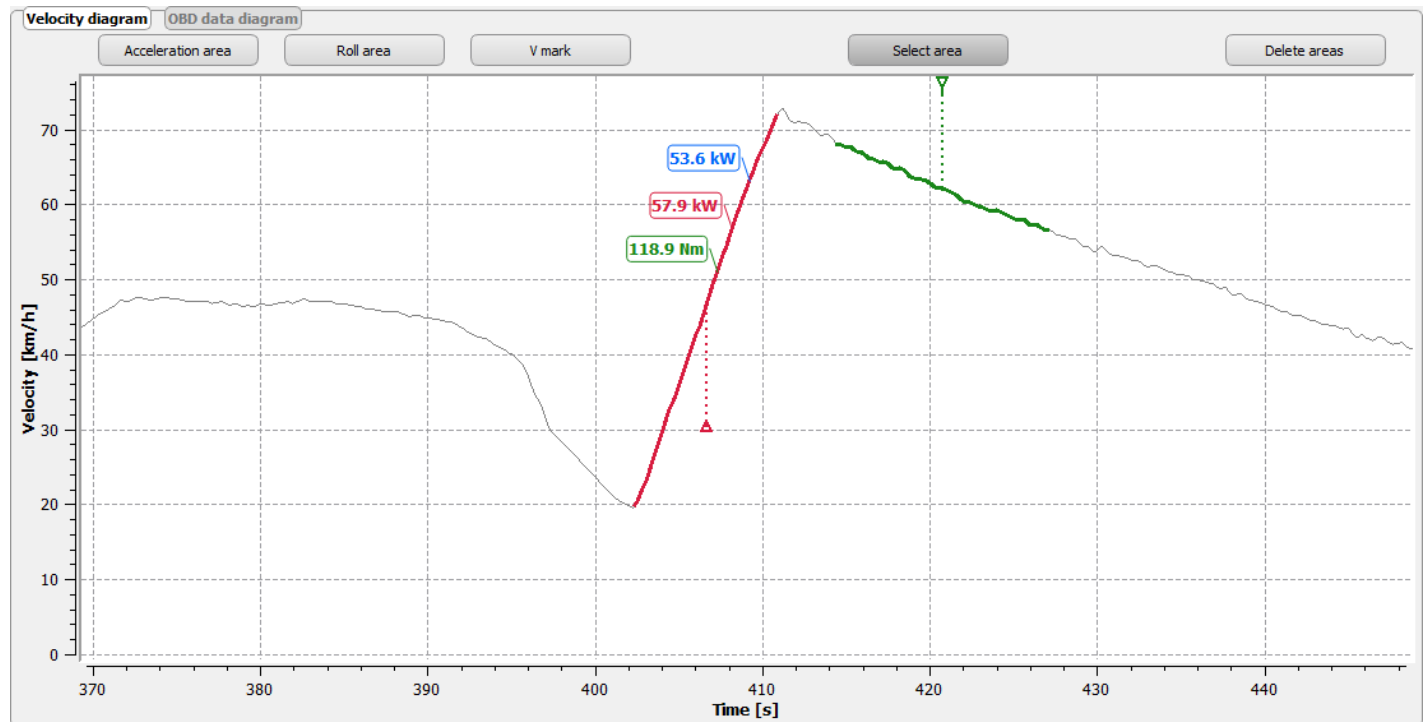
Activated reference lines and performance data are displayed in the PDF protocol.



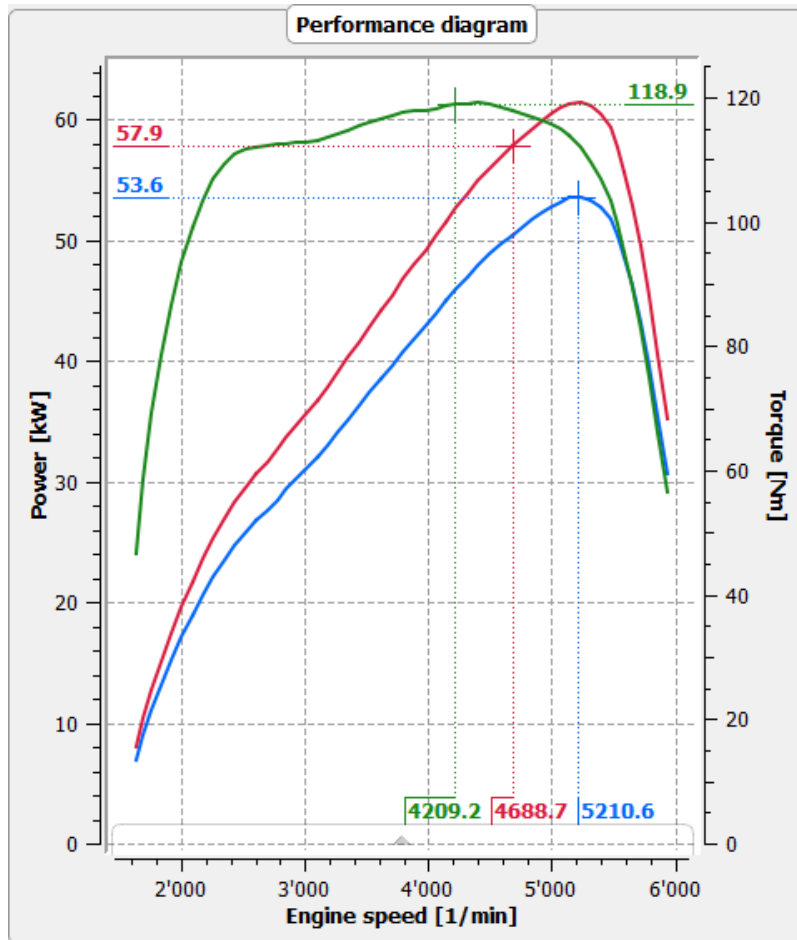
2.7.5.6.1. Speed diagram with performance data > RealPower 2.0

If measuring points are set in the performance diagram, they appear at the corresponding position on the acceleration range, in the speed diagram.

Speed diagram

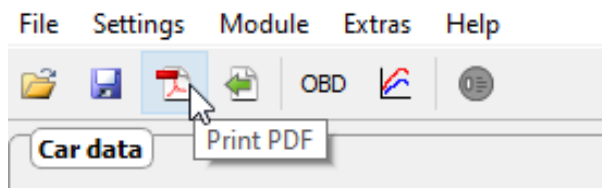


Performance diagram



2.7.6. Producing a test certificate

As soon as the analysis of the data from a road test is complete, all the results can be printed out in a test certificate.



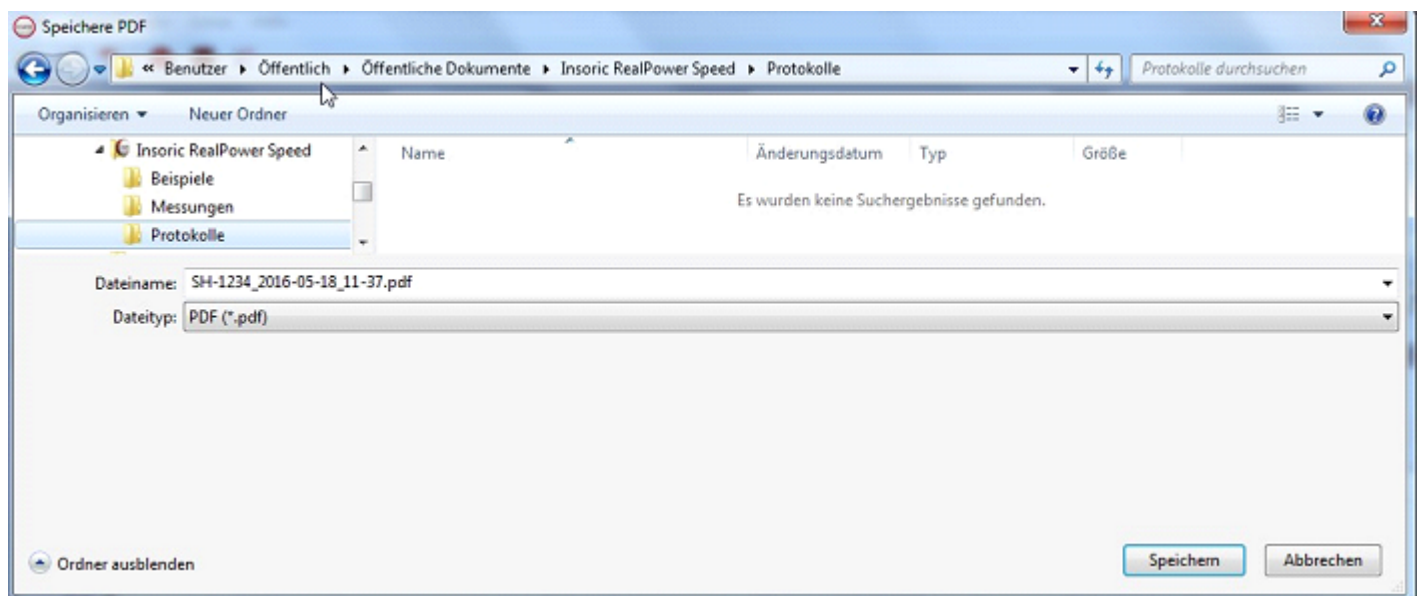
Clicking the **"Print PDF"** button creates a PDF document and then opens it in the Acrobat Reader[®] application. The test certificate can then be printed out on a printer using the print function in Acrobat Reader[®].

To print out the test certificate, you need the Acrobat Reader[®] application.

When you press the **"Print PDF"** button, a window opens suggesting a file name and location for saving the PDF file.

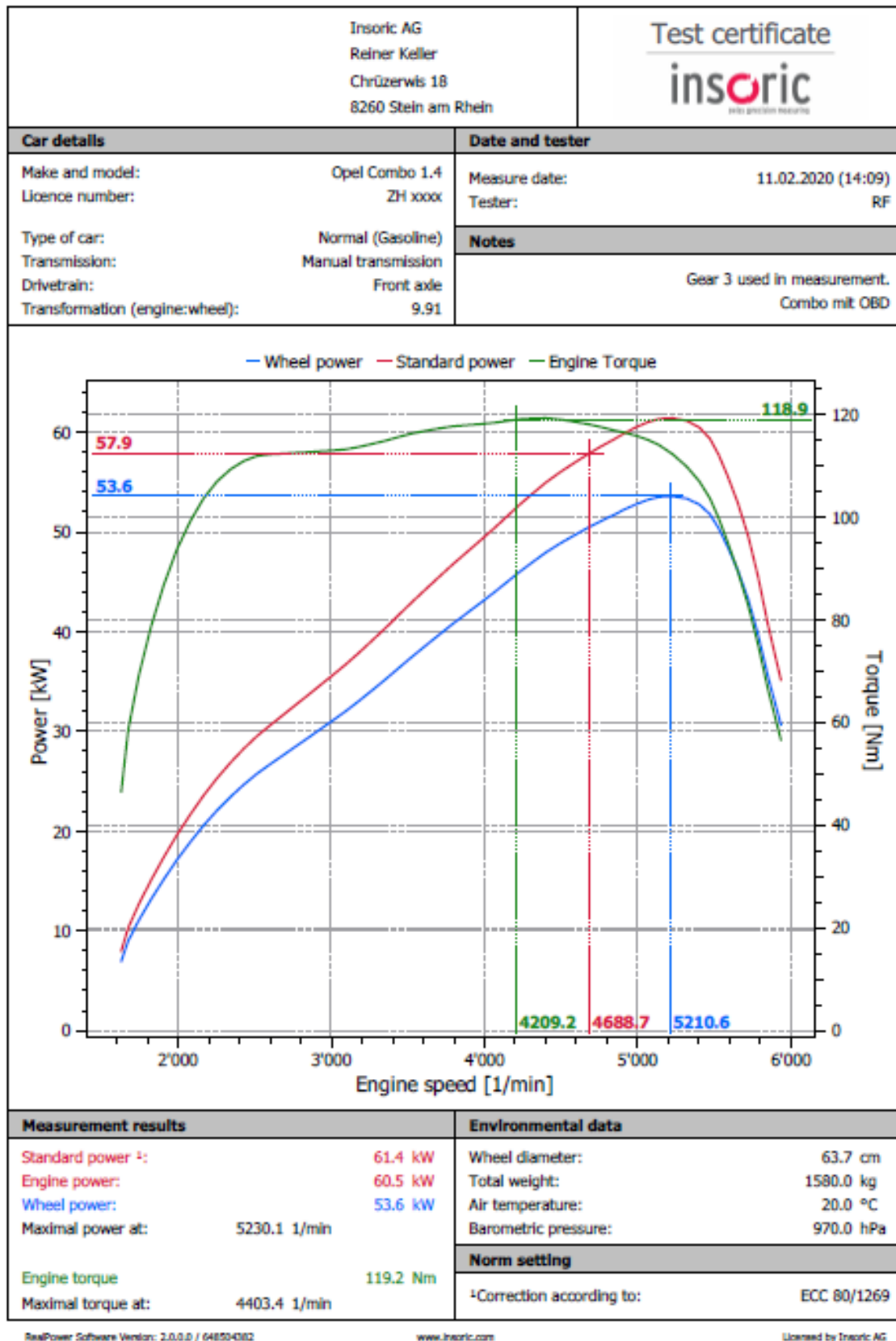
A file name that clearly identifies the measurement results – e.g. indicating registration number, date and time – will simplify subsequent retrieval of the data and prevent accidental deletion of other files in the same folder.

The RealPower software automatically creates a folder for PDF files when it is installed. However, you can choose to save the files anywhere else.



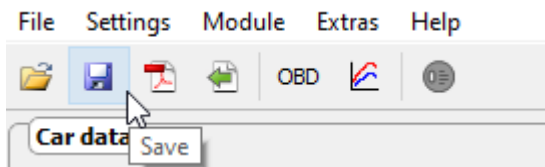
Pressing **"Save"** saves the file with the specified name in the specified folder/directory.

When the file has been saved, the test certificate is displayed on the screen.

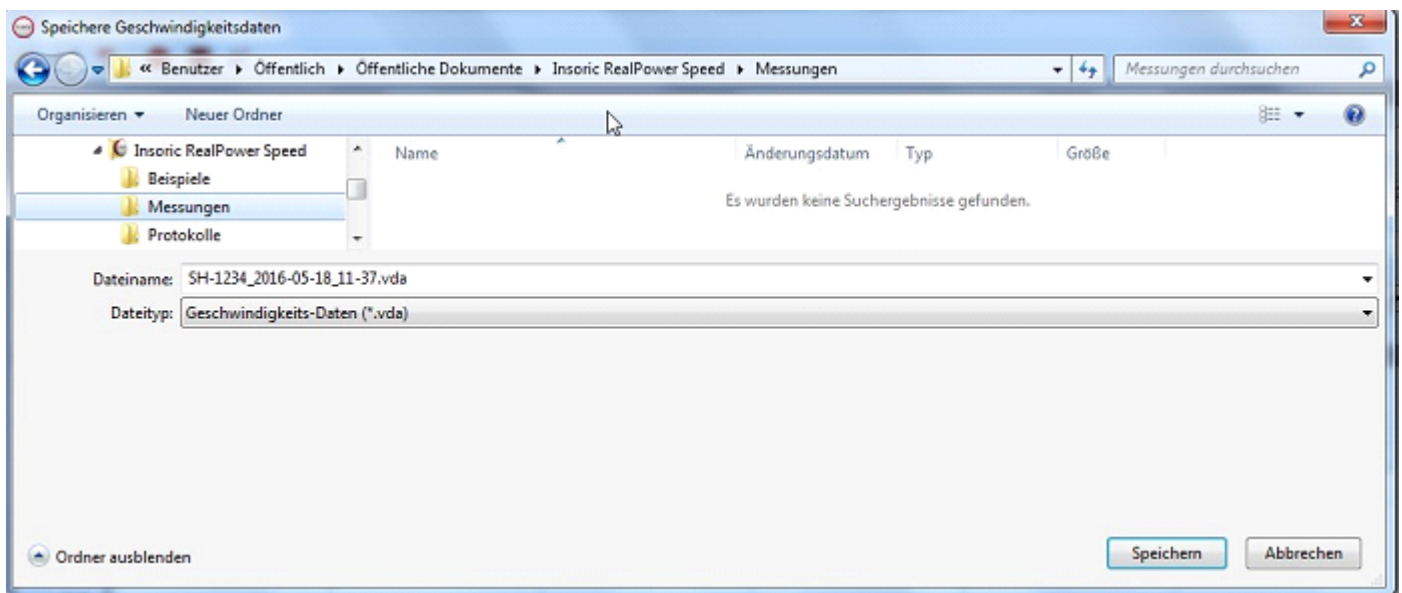


2.7.7. Saving the measurement results

Analysed test data can be saved to your hard disk by pressing the **"Save"** button or by Choosing **"File > Save As"**.

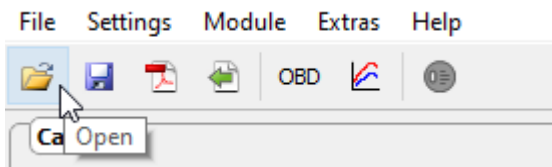


The RealPower software suggests a clearly identifiable name for the file. That name is made up of the registration number, date and time. But here again, you can change the file name and where it is saved as you wish.



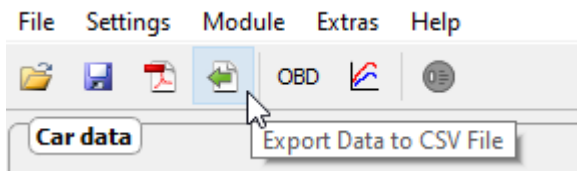
2.7.8. Opening measurement results

You can open previously saved test data or test certificates by choosing **"File > Open"** or clicking the **"Open"** button.

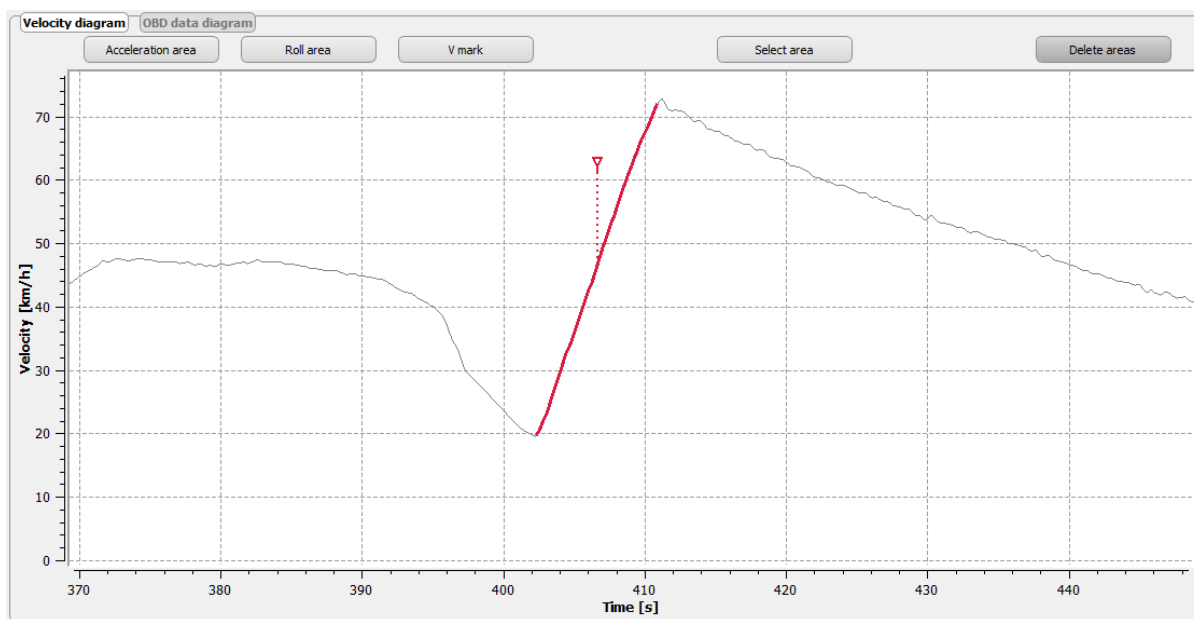


2.7.9. Export data

By selecting "File > Export" or the icon "Export Data to CSV File" measurement data can be exported into a CSV File.



Only measurement data within the acceleration phase and the red indication will be exported.

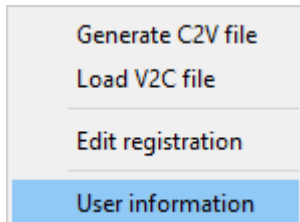


The selections made in "**Power unit**", "**Time unit**" and "**Velocity unit**", which can be found in "**Settings**" (see chapter 2.7.2), will have an influence on the units shown in the CSV File.

Time [s]	Engine speed [rpm (E)]	Wheel power [kW]	Engine power [kW]	Engine Torque [Nm]
0	2271.09132	25.98284	31.927193	134.244931

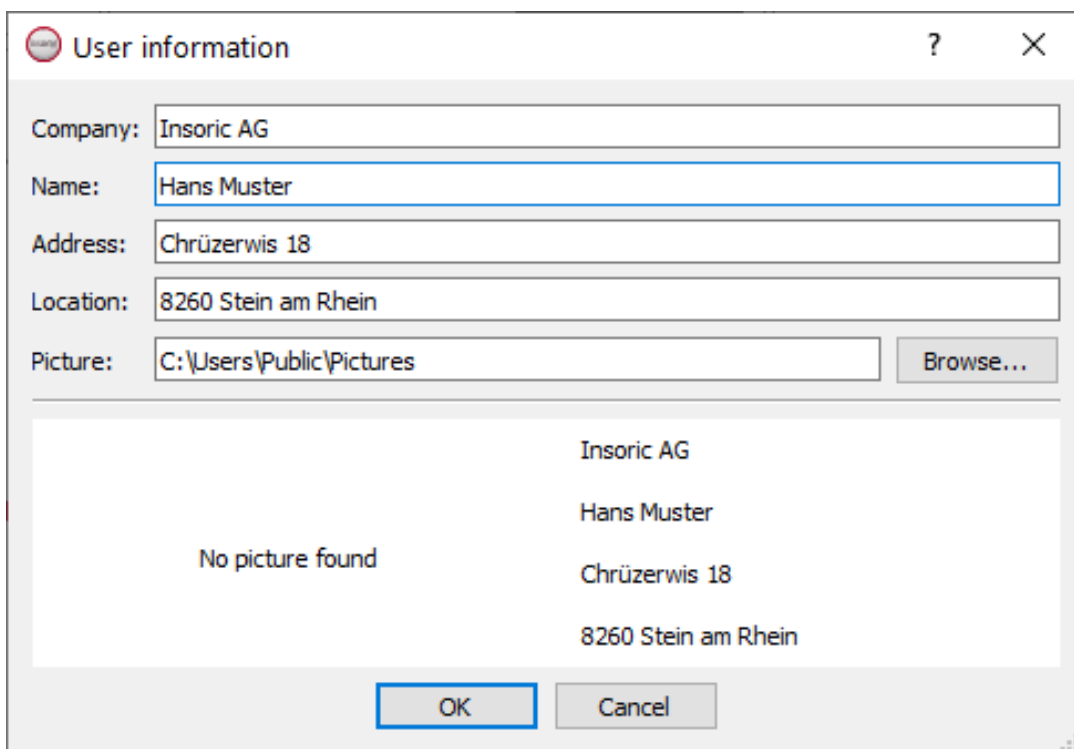
2.7.10. User Informations / Registration

Choosing **"Extras" > "User information"** opens a window in which you can enter general details that are to appear on the test certificate



Master data

In the master data field, the user's information is stored that is to appear in the header of the measurement report. The button **"Browse"** is for the import of an own company logo.



The dialog box titled "User information" contains the following fields and controls:

- Company:** Insoric AG
- Name:** Hans Muster
- Address:** Chrüzerwis 18
- Location:** 8260 Stein am Rhein
- Picture:** C:\Users\Public\Pictures (with a **Browse...** button)

Below the input fields, a preview area displays the entered information:

No picture found	Insoric AG
	Hans Muster
	Chrüzerwis 18
	8260 Stein am Rhein

At the bottom, there are **OK** and **Cancel** buttons.

Selecting **"Extras > Edit registration"** a window containing your user information opens up. The data can be edited if desired.

Generate C2V file
Load V2C file
Edit registration
User information

Registration data

The registration is divided into commercial and private users

Registration

Please edit desired fields:

Company
Private

Company
Insoric AG
1

VAT ID
VAT ID

First name
Hans

Last name
Muster

Street
Chrüzerwis 18
1

Postal code
8260
1

City
Stein am Rhein
1

Country
Switzerland
1

Email
infor@insoric.com
1

Phone
Phone

1 Required field

☒ Yes, please send me your email newsletter or notifications of special offers

Register
Cancel

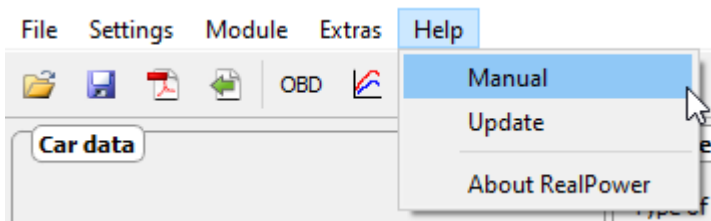
Example.

Generate C2V file
Load V2C file
Edit registration
User information

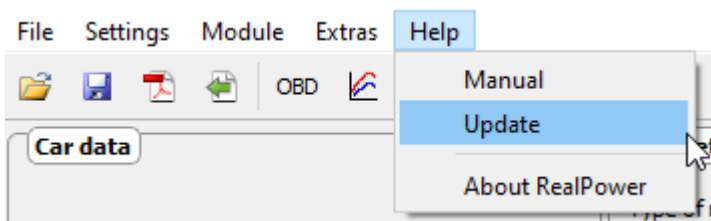
*The other items on the **"Extras"** menu are not required for normal use of the RealPower software. They relate to individual customer service and adding extra test credits (Insoric ReCharge).*

2.7.10. Update /Upgrade

Selecting "**Help**" > "**Manual**" will show up the current manuals for the software.



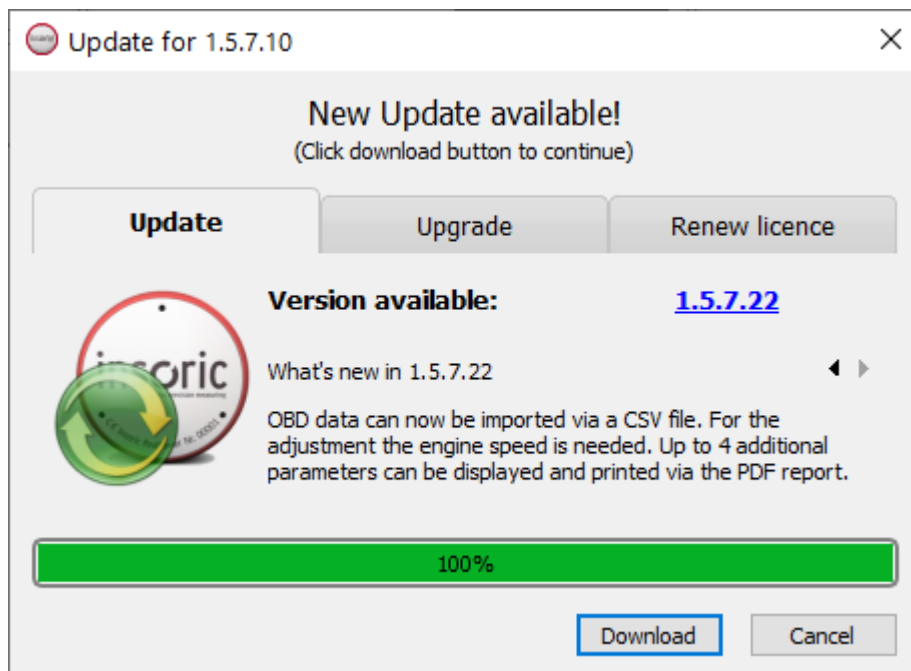
Selecting "**Help**" > "**Update**" you will receive information if a update or upgrade is available.



Via menu "**Help**" > "**Update**" is used to search for the latest software. The PC must be connected to the Internet.

Update (free of charge)

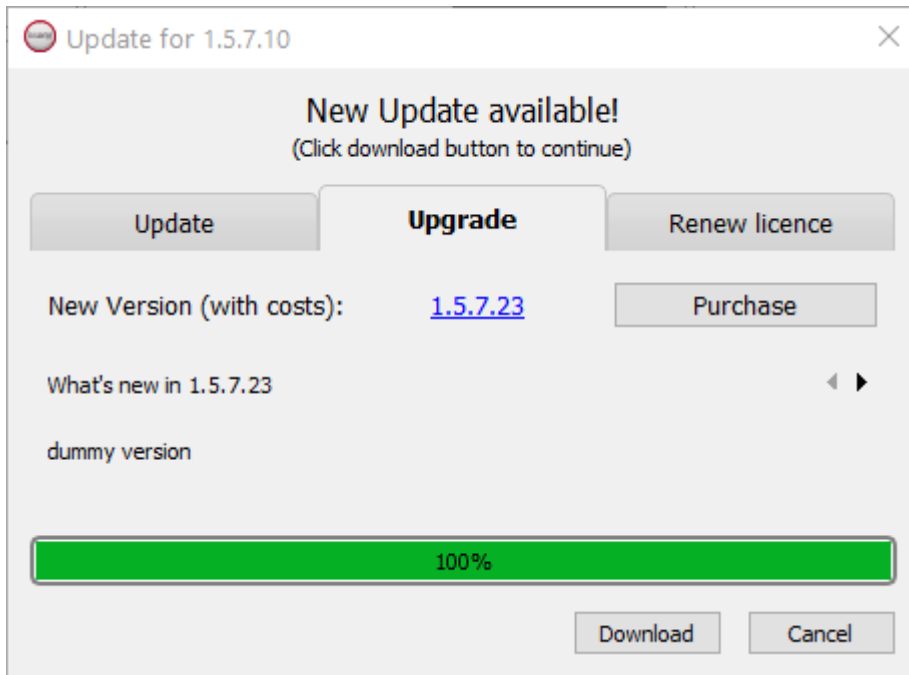
With the button "**Download**" the verified download and installation takes place.



Upgrade (chargeable version from 2.0.0.0)

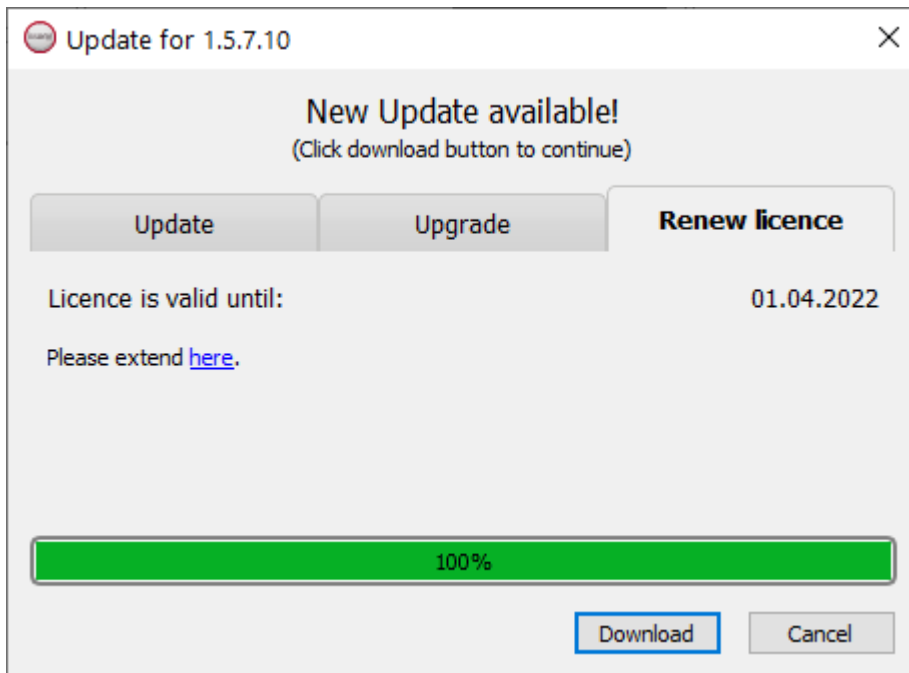
With the button "**Buy**" the order process is triggered and after successful completion the download is enabled.

With the button "**Download**" the verified download and installation takes place.



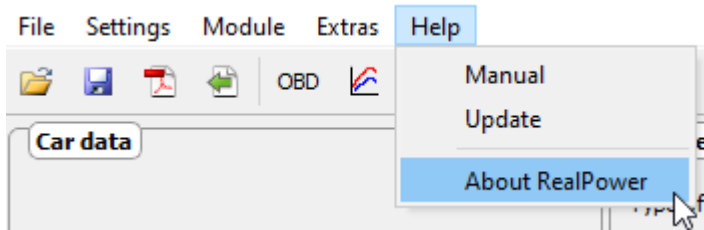
Renew license (chargeable for version from 2.0.0.0)

The use of the software 2.0.0.0 is runtime bound and can be renewed here before expiration or after expiration.

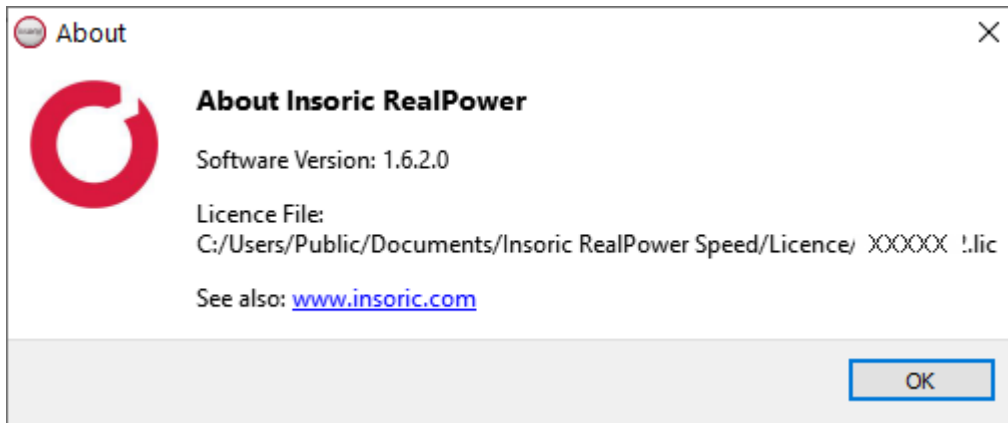


Software information

Selecting "**Help**" > "**About RealPower**" you will receive information about the software version.



Software version and license file will be displayed



Example.

3. General instructions

3.1. Maintenance and cleaning	84
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3.1. Maintenance and cleaning

Insoric RealPower and its accessories do not require any special maintenance. Dirt that gets onto the equipment in the course of use can be removed with a damp cloth.

NOTICE Risk of property damage

Washing and immersing in liquids may damage the electronics.

3.2. Rectifying errors and faults

In the event of faults occurring on the Insoric RealPower module (display "ERROR")* or in the event of a malfunction, contact the manufacturer at www.insoric.com/service.

For possible errors and how to avoid them during the measurement process, data collection or data evaluation, please contact our service platform at www.insoric.com/service.

** The display "ERROR" appears even if the module memory is full. By clearing the memory via the RealPower software, the "ERROR" message goes out afterwards in this case.*

3.3. Technical data

Data analysed to ECC, DIN, ISO, SAE, None, Temperature correction, OBD

Modul

Max. recording time	80 minutes
Power consumption	2mA
Function indication	LED
Measurement accuracy	0,001 Hz at 10 Hz
Operating conditions	0 bis 40 °C
Max. rel. air humidity	< 80 % (non-condensing)
Max. operating altitude	2000 m
Weight	35 g
Dimensions (dia. x h)	42 mm x 12 mm

CE Conformity

The product in the form as delivered is in conformity with the provisions of the following European Directives:

204/108/EC Electromagnetic compatibility (EMC) – (successor of 89/336/EEC with amendments)

1999/519/EC Limitation of the public exposure to electromagnetic fields (council recommendation)

2002/95/EC Restriction of hazardous substances (RoHS)

72/245/EEC Radio interference (electromagnetic compatibility) of vehicles (Last updated by CE-Conformity 2009/19/EC)
A copy of the original declaration of conformity can be downloaded from www.insoric.com.

A copy of the original Declaration of Conformity can be downloaded at www.insoric.com

RealPower Soft- and Hardware certification

Ilac, Albis engineering, Metas, Dynamic Test Center



Microsoft® - USB,



3.4. Disposal

Electronic devices contain recyclable raw materials and should not be disposed of as normal household refuse.

When the device has reached the end of its service life, it must be disposed of at a local recycling centre in accordance with the applicable statutory regulations in the country of use.

