

Manual

SRM – High Performance Ergometer



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1. General preparation for performance diagnostics

- Power-on spiroergometry (30min before beginning of test)
- Power-on ergometer's power supply
- Preparation diagnostic devices (Lactate analysis, etc.) 30min beginning of test
- Room temperature (18 – 24°C) should be measured
- Relative air humidity should be measured (30 – 60%) in room
- Check position of ventilator

2. Connecting the Ergometer (Ports)



1- Power Supply

2- Serial Port

The serial port is only for the external control by CPX/CPET, EKG or other medical devices by the so called "ergoline" protocol. The idea is to specify the protocols in the CPX/CPET or EKG software to be independent of the SRM Ergometer software.

Please connect the SRM ergometer via the serial port and the USB-to-Serial Adapter to the controlling computer.

Please note: If you like to control the protocol by an external device don't start the performance diagnostics in the SRM ergometer software.

3- Torque Analysis

4- Ethernet Ergometer

3. Installation and Landing Page of the SRM Ergometer Software

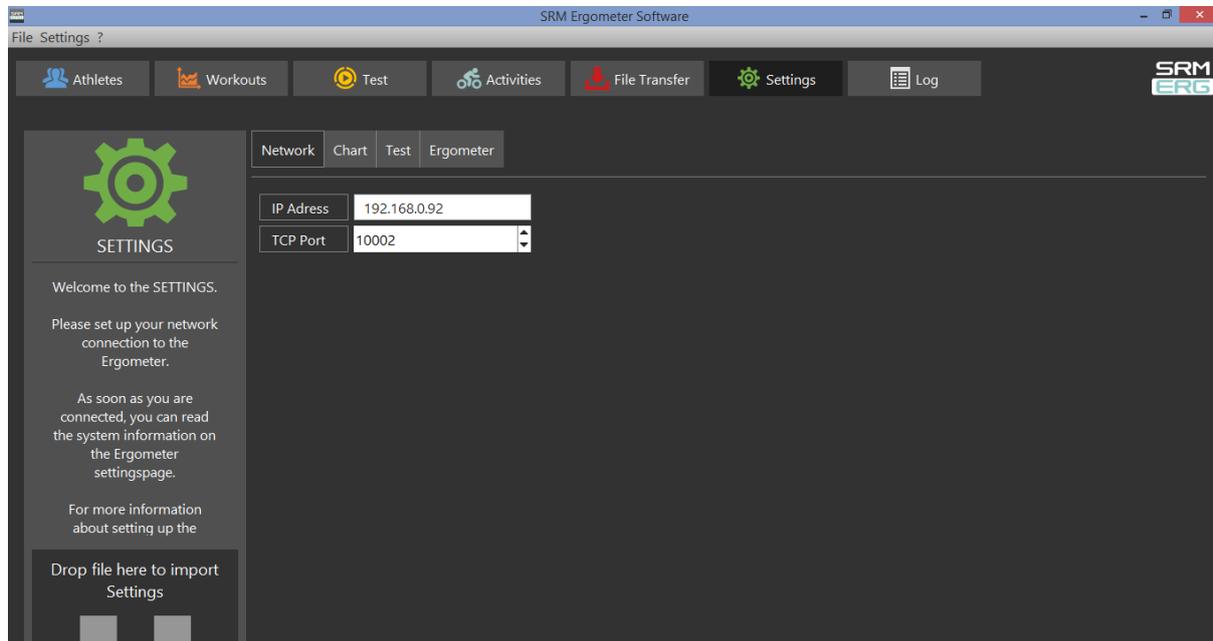
Please install the SRM ergometer software first on your controlling computer.

It's possible to choose one of the shown options directly. But before starting with the test procedure we recommend to check the settings first. Please start pedaling and check the connection indicator on the lower left corner of the screen: this indicator should be green, if not go to log tab and check the messages and the settings again.



4. Settings SRM Ergometer Software

Network



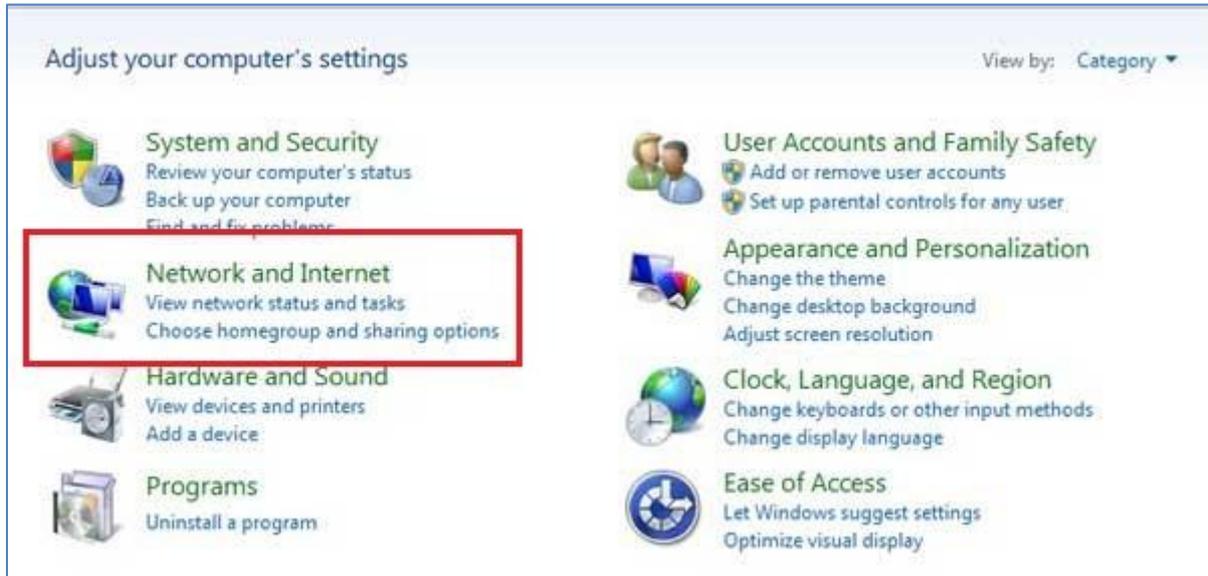
Choose a free and valid IP address (192.168.0.x) for your computer in the same sub network as the SRM Ethernet Torque Analysis Box (To install the Torque Analysis Box see the manual of the Torque Analysis).

If you are using MS Windows: Press "Start" button, open "Control Panel", open "Network and Internet", select "Network and Sharing Center", click "View Network Connections", click on the connection you need to change (i.e. LAN), open "Properties", double click on "Internet Protocol Version 4 (TCP/IPv4)" and insert the chosen IP address.

Please insert a different IP address than that of the Torque Box. Just change the last or the last two numbers of the Torque Box IP (e.g. 192.168.0.89). Otherwise there will be a conflict of the IP addresses.

Network settings in windows

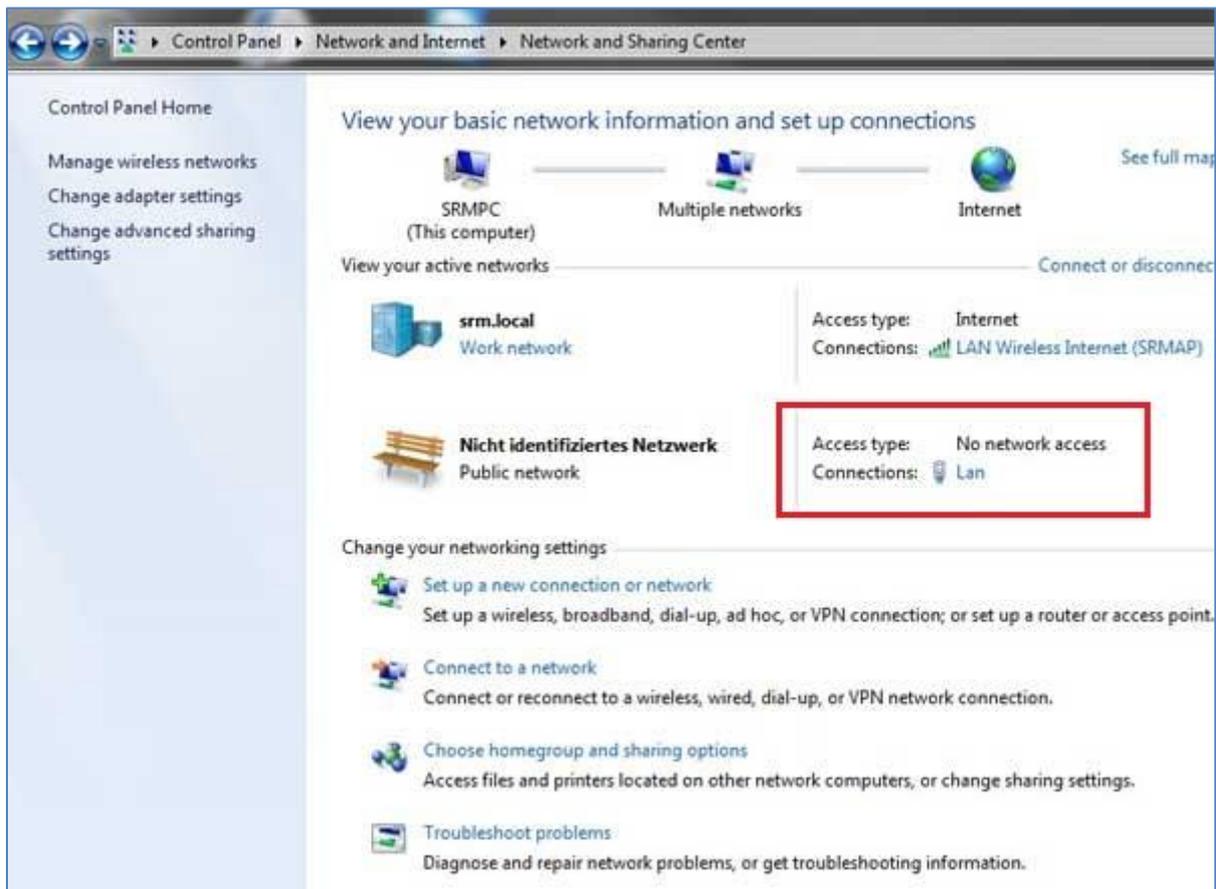
1. Network and Internet



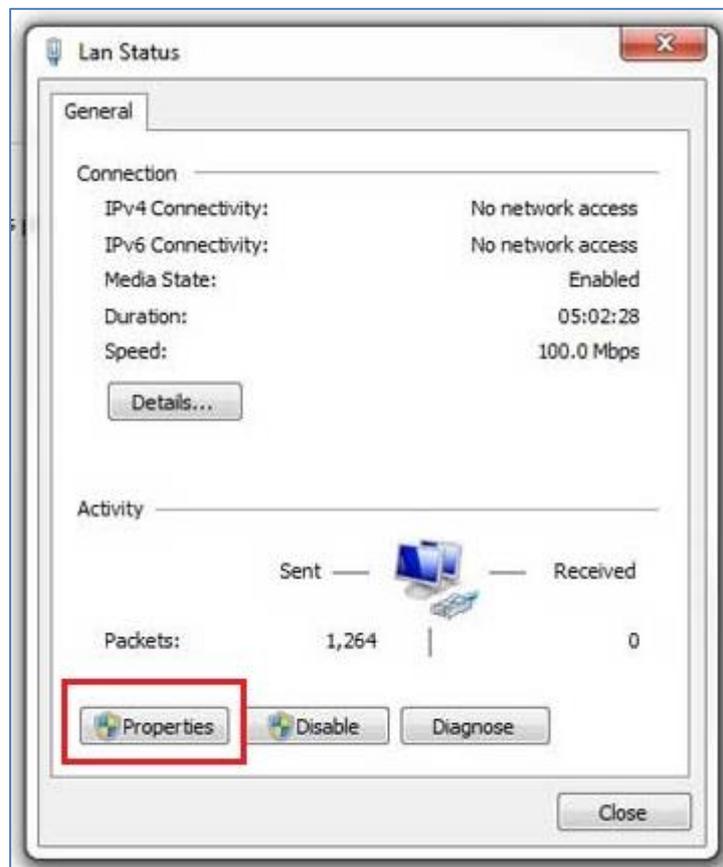
2. Network and Sharing Center



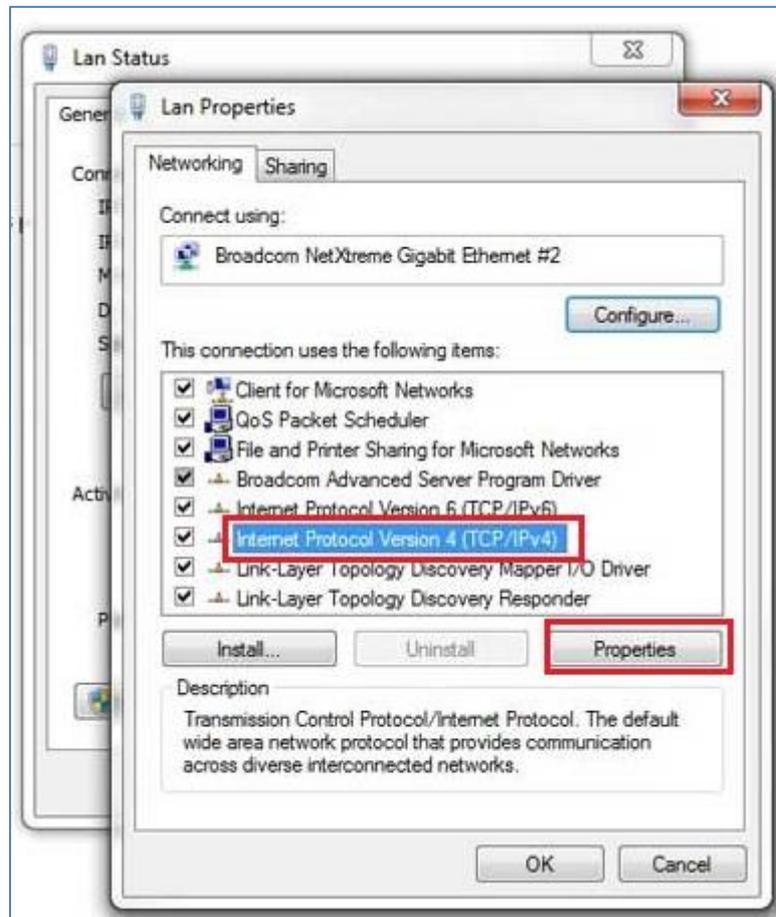
3. View Network Connections



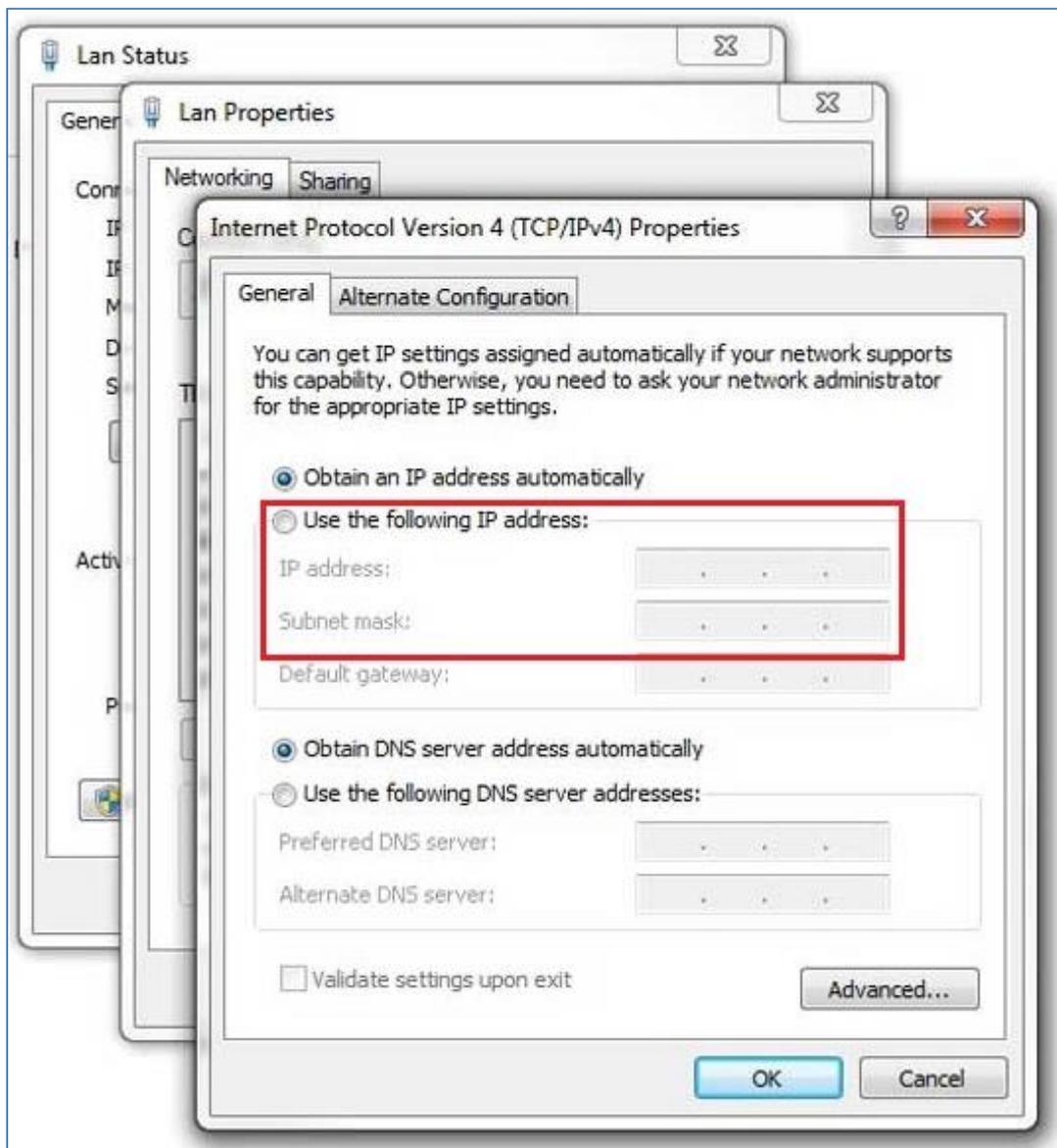
4. Properties



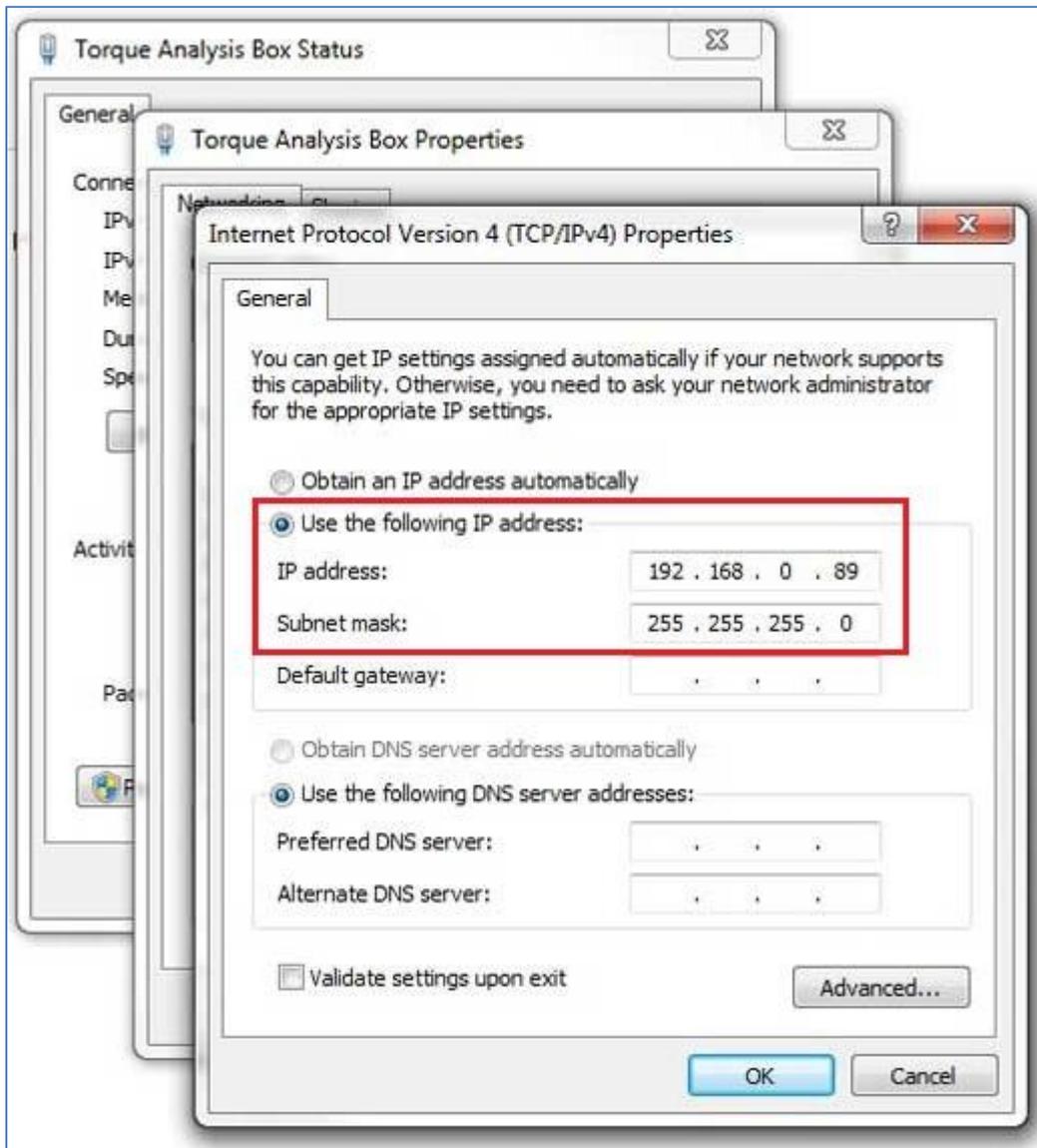
5. Internet Protocol Version 4 (TCP/Ipv4)



6. Use the following IP address



7. IP address: 192.168.0.89

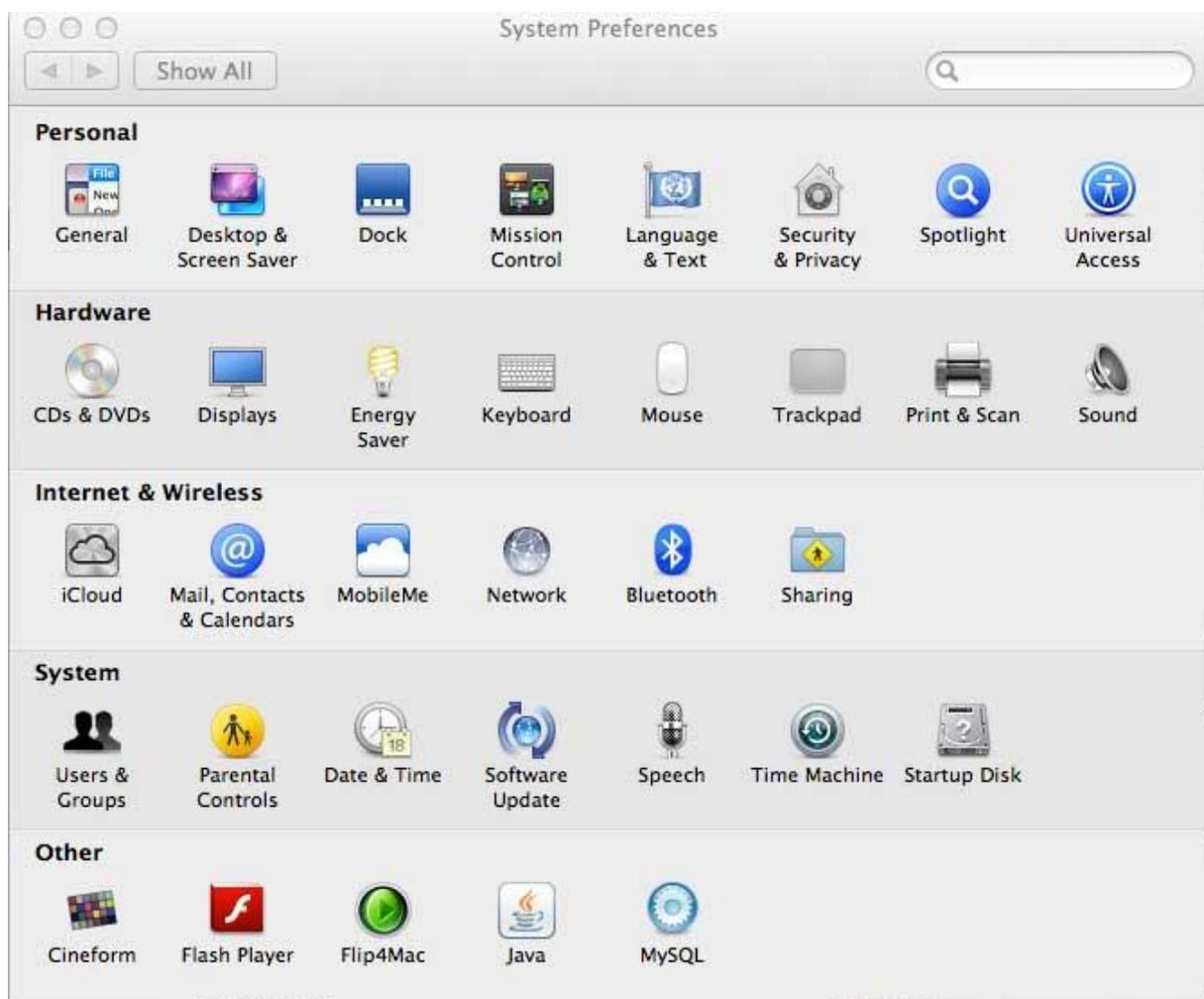


Please start the ergometer software again, start pedaling and check the connection indicator on the lower left corner of the screen: this indicator should be green. If not go to log tab and check the messages and the settings again.

Network settings in OSX

If you are using Apple OSX: Launch „System Preferences“ from the Apple menu (or Spotlight), click on the „Network“ icon in the lower right, click on the „Advanced“ button, in the pulldown menu next to „Configure Ipv4“ select „Manually“ and insert the chosen IP address.

1. System Preferences



2. Network

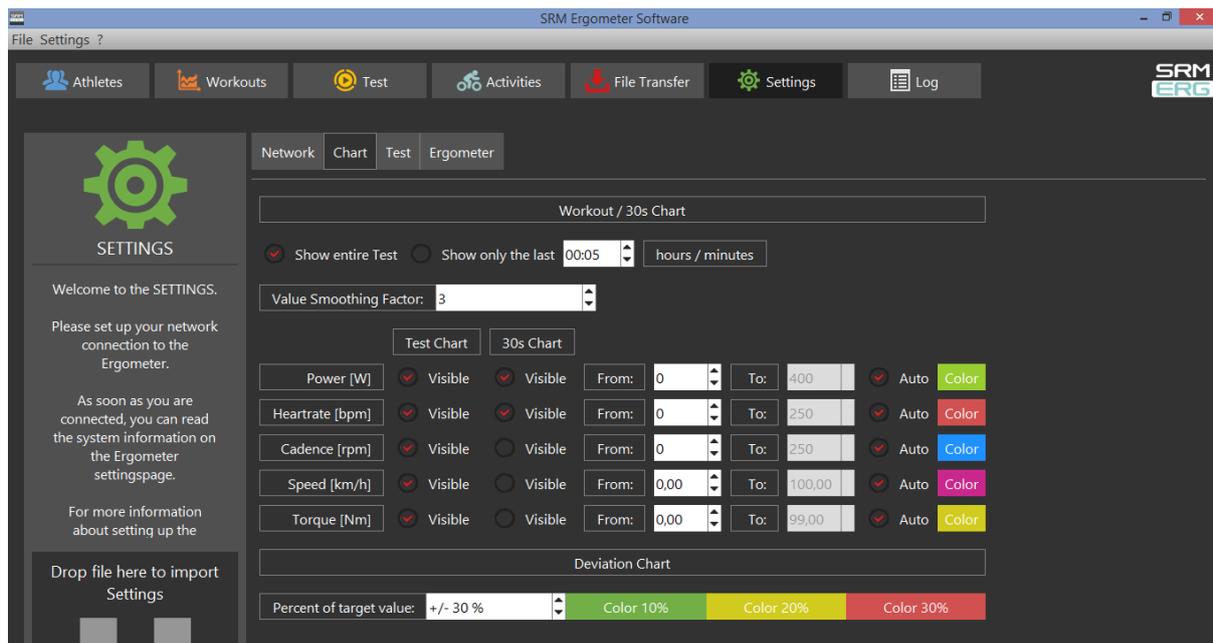


3. Set the IP Address under Ethernet



Please start the ergometer software again, start pedaling and check the connection indicator on the lower left corner of the screen: this indicator should be green. If not go to log tab and check the messages and the settings again.

Chart

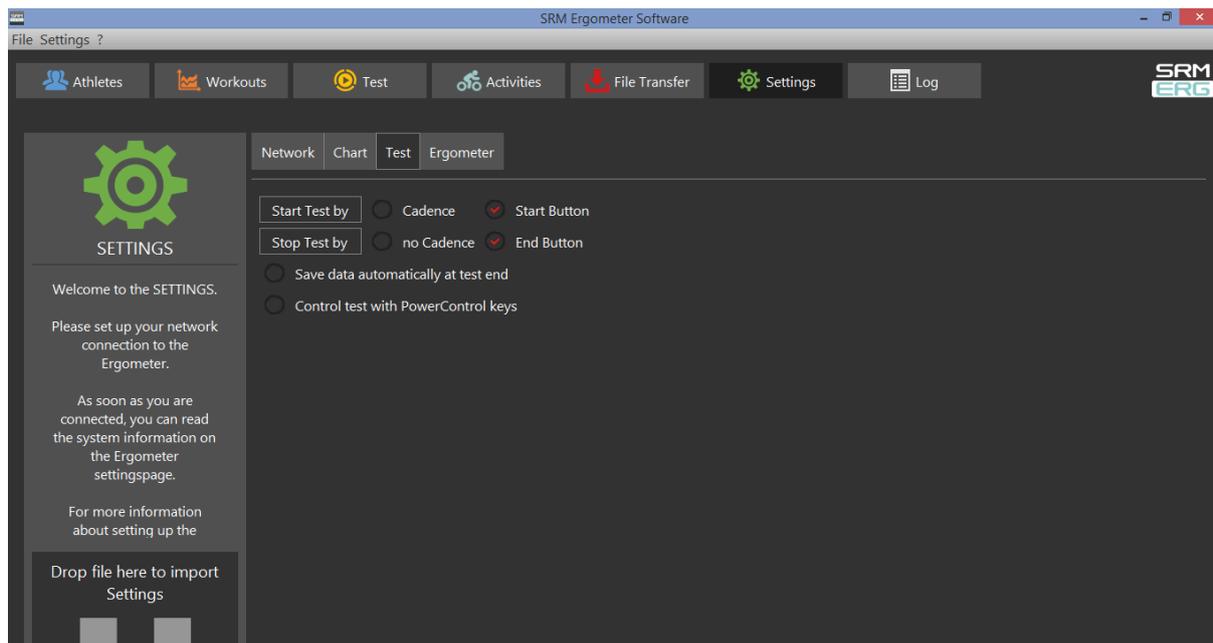


In this menu you can set the scaling of the graphs and the length of the displayed segments.

By selection of *Show entire Test* you will be shown the entire test on the monitor. By clicking on "Show only the last...minutes", you will only be shown the time period you entered before.

In the lower part of the window please specify by clicking on *Visible*, if you want to see the values *Power*, *Heart rate*, *Cadence* and/or *Speed*. Under *From / To*, you can define the range, in which the values will be shown. *Distance* gives you the difference of the chosen range.

Test



Start Test by

Under the button *Start Test by* you can decide if the test (or training session) will be started by reaching a specific cadence or by clicking the *Start Button*.

Stop Test by

Under *Stop Test by* you can decide if the test will end automatically when there is no more cadence to be measured or by manually clicking the *End Button*.

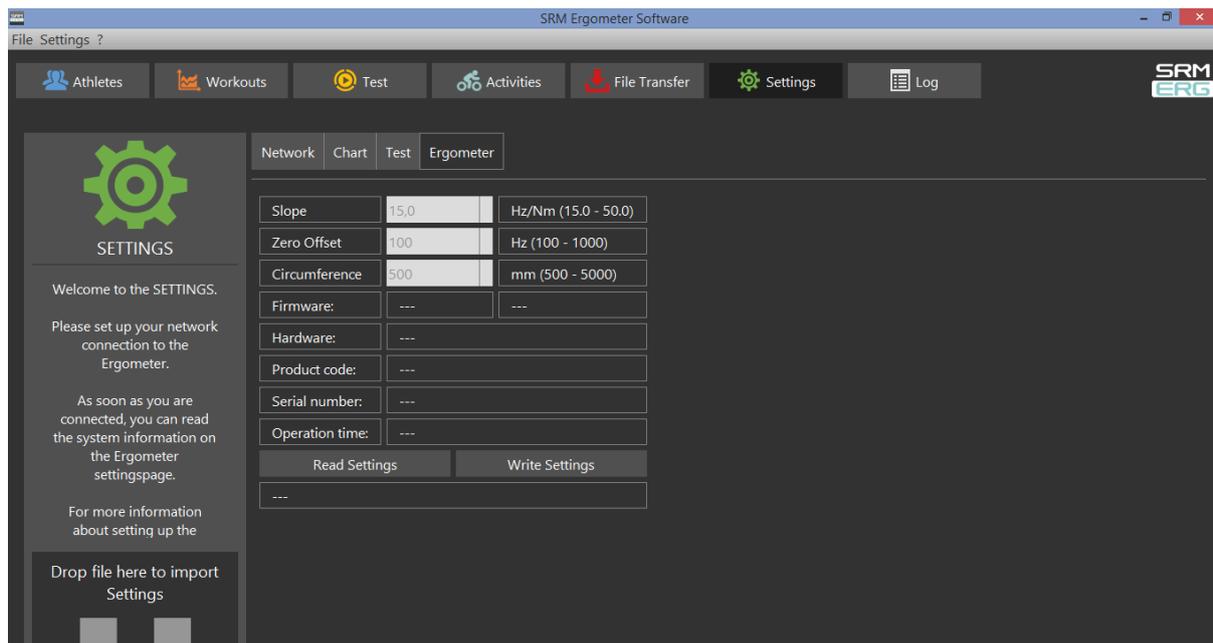
Save data automatically at test end

Here you can set an automatically storage of your data file on your computer. Even when you click no, you will asked to save the data file by ending the test.

Control test with PowerControl keys

Here you have the possibility to start and stop the test (or the training session) with the keys of the PowerControl.

Ergometer



Slope

The slope in the ergometer software must correspond to the slope of the PowerMeter and the PowerControl.

We recommend to verify and control the slope of the PowerMeter before every test day. You can find the correct PowerMeter slope on small labels located at

- the rear of the PowerMeter (s. PowerMeter picture),
- the front of the ergometer,
- the right crankarm,
- the handlebar.



Zero Offset

The PowerMeter delivers a certain frequency which is proportional to the torque of the pedal force on the crank. If there is no load on the crank, the PowerMeter is sending a base frequency which must be communicated to the ergometer software and to the PowerControl as a reference value. This procedure is called zero offset calibration (offset adjustment).

The zero offset calibration has to be done before every new assembly of the PowerMeter and also before every measurement resp. every training on the Ergometer. A wrong zero offset calibration can result in an internal miscalculation of the power.

Please perform the zero offset calibration as it is described below:

- For a manual comparison, please turn the right unloaded crank clockwise to activate the PowerMeter.
- Wait a few seconds until the displayed value is stabilized.

- By pressing the **Read Settings** button, the zero offset will be displayed in the white background field.
- Press the **Write Settings** button, so that the zero offset will be saved.

Circumference

The circumference only influence the displayed speed and is not important for the calculation of the data. We recommend to insert a value of 1.000 mm.

The following points show the current state of the ergometer. They are important for the identification and the service.

Firmware

The firmware can be updated if you drop the latest "**SRM Firmware Image**" file (*.sfi) in the box on the lower left corner of the screen: Drop file here to import.

The current firmware incl. date is displayed (e.g. V 1.0.8, 20.06.2016).

Hardware

Product Code

Serial Number

Operation time

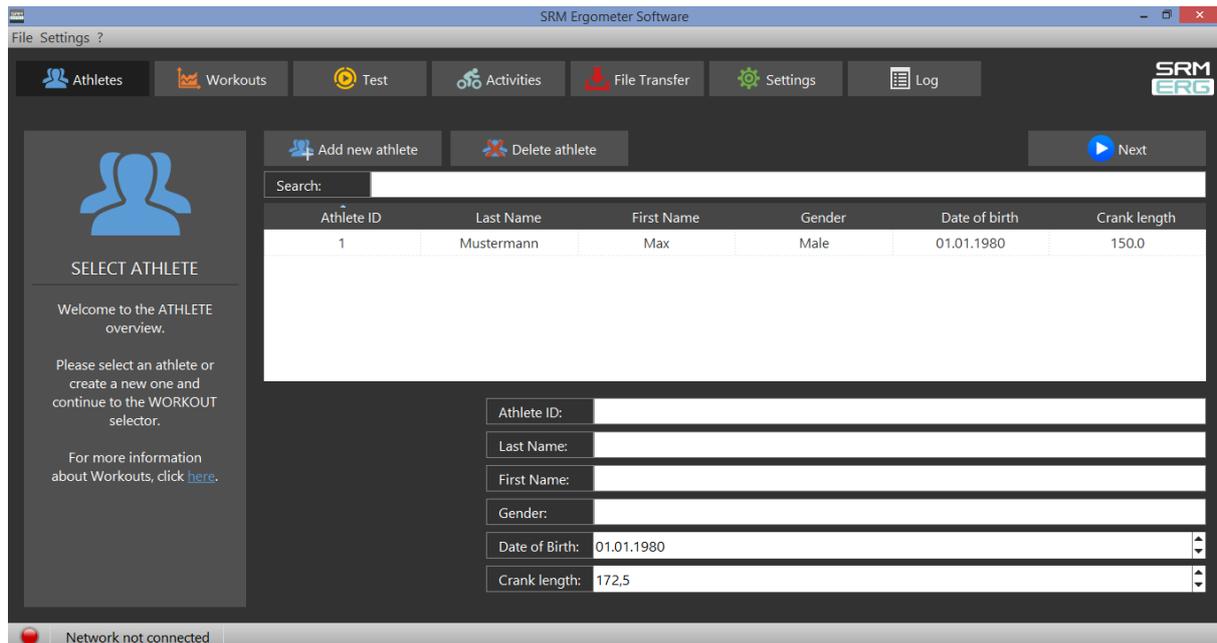
Read Settings

Read the current settings of the ergometer incl. the zero offset and the Slope.

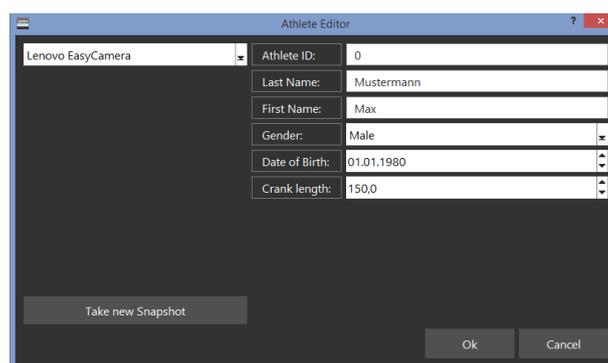
Write Settings

Here it is possible to insert the slope and to save/to write it for the correct data. Please note that the must be correspond to the slope of the PowerMeter.

5. Athletes



- Welcoming
- Clients prepare for test - put on the heart rate strap
- Choose the option "Add new athlete" to create a new profile or "Search" for an athlete you added before
- Documentation of personal data of client (name, height, weight, gender, date of birth, crank length)



- Completion questionnaire / exclusion of liability
- Discussion of the data and test procedure

6. Ergometer preparation for testing & training

Before every performance diagnostic or every training you should check the positioning of the athlete. The mechanical adjustment of the SRM – Ergometer allows the rider to find his individual positioning.

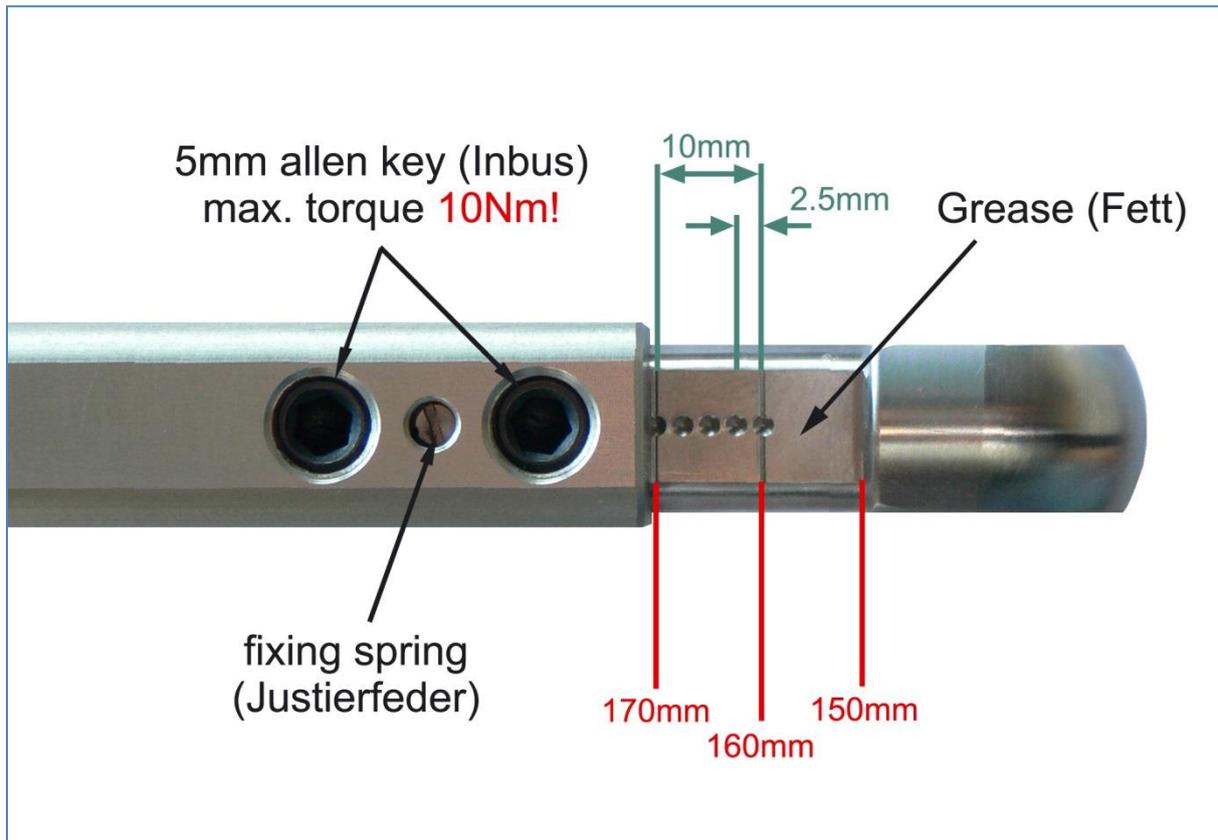
Settings the Crank length

First we recommend to mount the client's pedals and set-up the crank length as on client's bicycle.

The prolongable crank has round markings every 2.5 mm and every 10 mm a line. If the steel element of the crank is completely retracted in the aluminium crank the minimal length of the crank arm is 150 mm. If the crank arm is completely pulled out, the maximal length is 190 mm. Before changing the crank arm length you have to open both Allen screws.



After adjusting the right crank arm length, please tighten the Allen screws again with a maximal torque of 10 Nm so that they won't come loose while you ride the Ergometer. Make also sure that the screws are situated with a distance of a 2.5 mm. This can be determined when the fixing spring (situated between the Allen screws) locks into the holes of the steel element of the crank. Please do never remove or adjust the fixing spring.



From time to time it is necessary to grease the steel elements of the crank to protect them from sweat and to maintain the free movement.

Mechanical adjustment & positioning of the athlete

Optimizing individual positioning is quickly achieved by adjusting the saddle and handlebar vertically and/or horizontally. To do so you have to open the locking lever. Because of a ruler which is attached to the saddle post you can reproduce your perfect positioning.

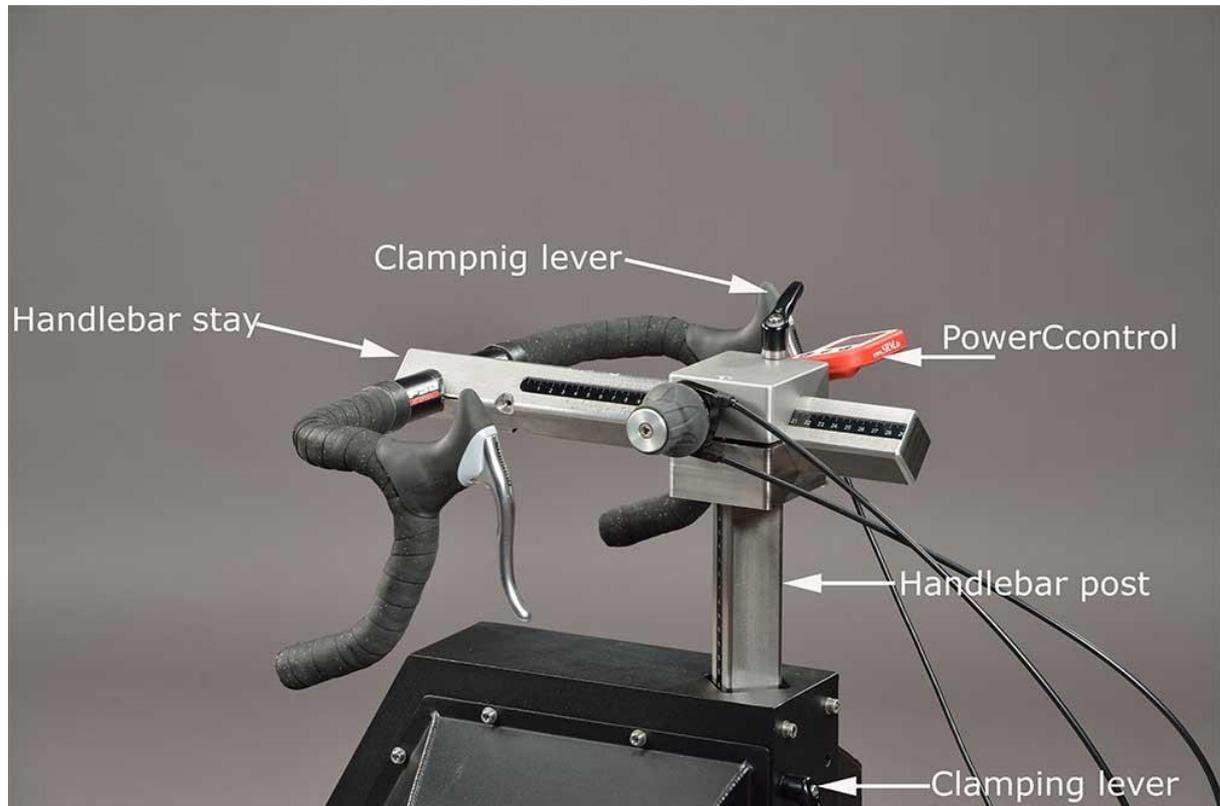
If adjusted correctly, it should be easy to move the vertical and horizontal stems when the quick release is open. A 5 mm Allen key situated on the saddle and handlebar mounts allows for further rigidity.

Horizontal & Vertical Positioning of the saddle

The ruler which is integrated in the seat stay gives you the distance between the center of the bottom bracket and the front of the saddle. The distance in cm can be read from the left hand side of the seat stay.



Horizontal / Vertical Positioning of the handlebars



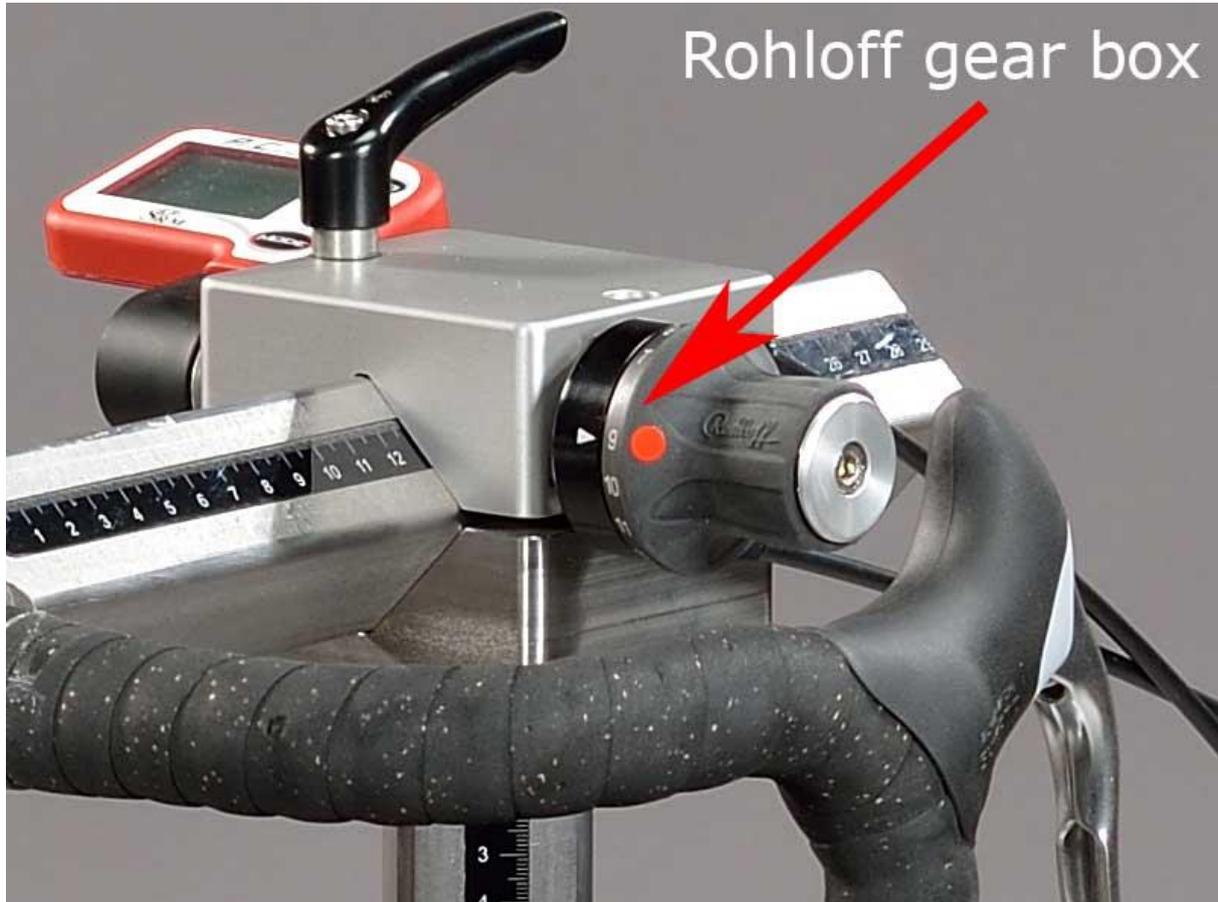
Bike fitting

Transfer settings of client's own bike to the sitting position.

 A side-view photograph of a person's lower leg and foot on a stationary bike. The person is standing on the pedals with their leg extended downwards. The text 'www.SRM.de' is visible on the bike's frame.	<p>Saddle height</p> <p>The heel with the extended leg should reach the lowest position in the pedaling cycle.</p>
 A side-view photograph of a person's legs on a stationary bike. The person is sitting on the saddle with their feet on the pedals. The knee is positioned vertically above the pedal axle. The SRM logo and 'www.SRM.de' are visible on the bike's frame.	<p>Saddle setback</p> <p>In the horizontal position of the crank the knee (patella) should be perpendicular to the pedals axle.</p>

Rohloff gear check

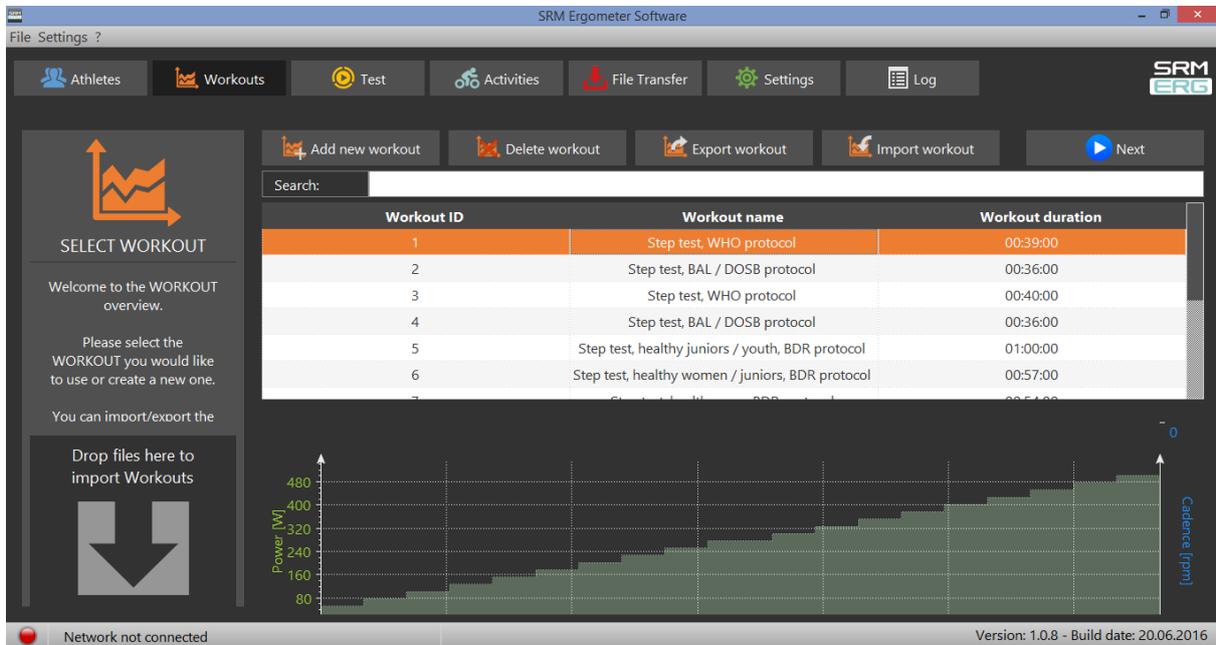
We recommend to verify the gear of the Rohloff hub before every test or training. Our general recommendation is to use gear 9 - corresponding to the red point at the turning handle.



Warm-up

- Recommendation of at least 3 - 4 min with a low workload (e.g. 75-100W)
 - predefined warm-up
- Check the correct settings for:
 - Heart rate
 - Cadence
 - Power
 - Speed

7. Workouts



The screenshot shows the SRM Ergometer Software interface. The top menu bar includes 'Athletes', 'Workouts', 'Test', 'Activities', 'File Transfer', 'Settings', and 'Log'. The 'Workouts' menu is active, showing options: 'Add new workout', 'Delete workout', 'Export workout', 'Import workout', and 'Next'. Below the menu is a search bar and a table of workouts.

Workout ID	Workout name	Workout duration
1	Step test, WHO protocol	00:39:00
2	Step test, BAL / DOSB protocol	00:36:00
3	Step test, WHO protocol	00:40:00
4	Step test, BAL / DOSB protocol	00:36:00
5	Step test, healthy juniors / youth, BDR protocol	01:00:00
6	Step test, healthy women / juniors, BDR protocol	00:57:00
7	Step test, healthy men / juniors, BDR protocol	00:54:00

Below the table is a graph showing Power [W] on the left y-axis (0 to 480) and Cadence [rpm] on the right y-axis (0 to 100). The graph displays a step-like increase in power over time. At the bottom, there is a status bar with 'Network not connected' on the left and 'Version: 1.0.8 - Build date: 20.06.2016' on the right.

Determine the test protocol:

- Add new workout
- Import new workout
- Drop file to import workout

You can import new workouts as .erg files and as .fit files.

8. Test



Start and Stop performance diagnostics

BRAKE ON: The brake is active and the client can pedaling with resistance

BRAKE OFF: The brake is deactivate and the client can continue pedaling without resistance and cool down – continuous recording of the heartrate
(No Brake or Brake on only works in combination with an Ergometer)

START: Start by beginning to pedal or pushing the Start Button (Check the values displayed on the computer screen)

STOP: Finish the test

PAUSE: Interrupt the test

NEXT STEP: Go to the next step of the test

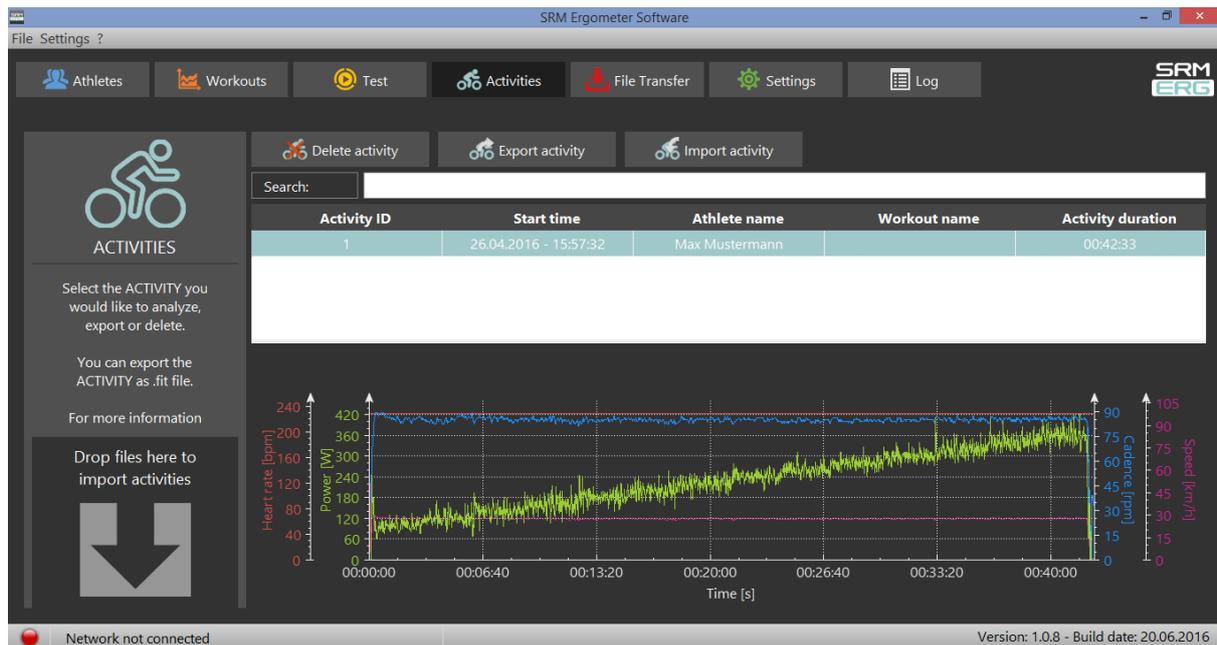
LAST STEP: Go to the last step of the test

STOP ERGO: Stop the ergo immediately (it only works without cadence)

Next steps

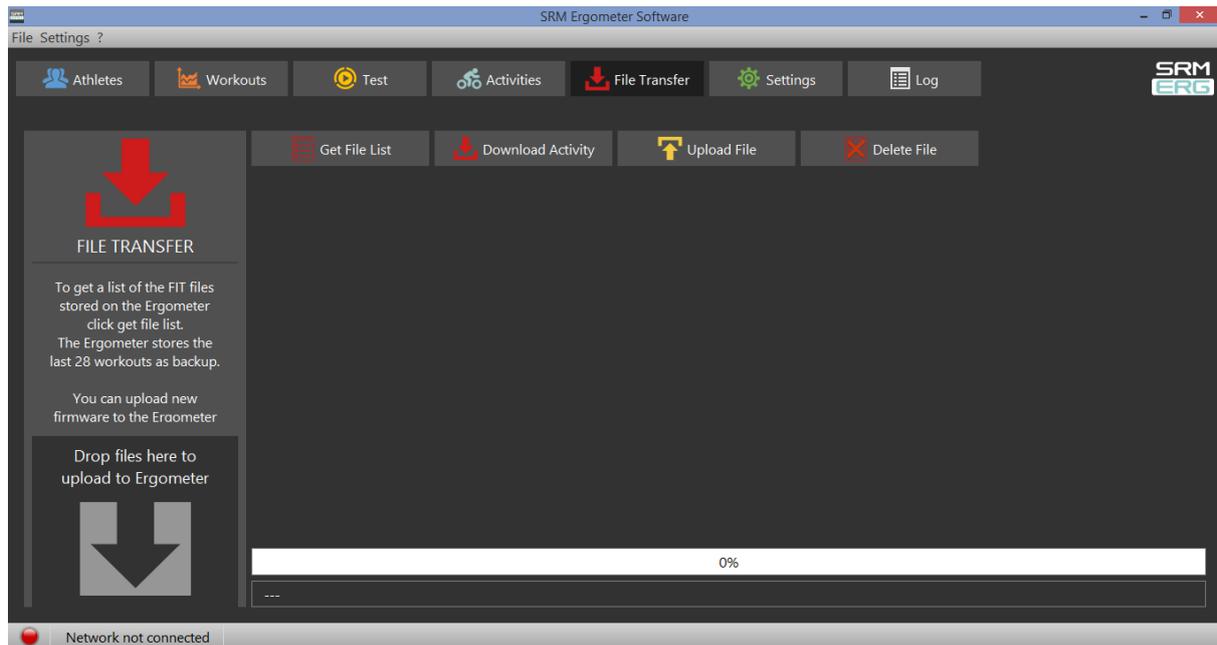
- Comment: Entry file name then press Save
- Recommended cool – down - protocol with lower workload
- Clean the ergometer (!)

9. Activities



- Select activity to analyze, export or delete
- Export activity as .fit file, pdf, png, jpg
- Activity-ID is automatically generated

10. File Transfer



GET FILE LIST:

- Get a list of the FIT files
- Upload new files to the Ergometer or Download an activity
- The Ergometer stores the last 28 workouts as backup

DOWNLOAD ACTIVITY:

- To determine the save location

UPLOAD FILE:

- You can upload new firmware to the Ergometer (.sfi files)

11. Service

Recommendation:

- crank: send in for service every two years
 - ergometer: send in for service every four years
-

12. FAQ

1. No resistance from ergometer

- check speed
- check 'Brake is on'
- check PowerControl → Cadence, Power
- check slope, zero offset, circumference
- check the IP-address of the ergometer and the torque box

Contact person:

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