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 measured
- Relative air humidity should measure (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 independend 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

1991		SRM	I Ergometer Software			- 0 ×
File Settings ?						
🚜 Athletes 🛛 🕍 Work	outs 🜔 Test	K Activities	📥 File Transfer	🔅 Settings	🔲 Log	SRM ERG
Velcome to the SETTINGS. Welcome to the SETTINGS. Please set up your network connection to the Ergometer. As soon as you are connected, you can read the system information on the Ergometer settingspage. For more information about setting up the Drop file here to import Settings	Network Chart Test IP Adress 192.168.0 TCP Port 10002	Ergometer				

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

djust your computer's settings	View by: C		
System and Security Review your computer's status Back up your computer	User Accounts and Family Safety Add or remove user accounts Set up parental controls for any user		
Network and Internet View network status and tasks Choose homegroup and sharing options	Appearance and Personalization Change the theme Change desktop background Adjust screen resolution		
Hardware and Sound View devices and printers Add a device	Clock, Language, and Region Change keyboards or other input methods Change display language		
Programs Uninstall a program	Ease of Access Let Windows suggest settings Optimize visual display		



2. Network and Sharing Center

	View network status and tasks Connect to a network Add a wireless device to the network	View network computers and device
•3	HomeGroup Choose homegroup and sharing options	-
ເ ຊາ))	Change your homepage Manage browser add-ons DW WLAN Card Utility	Delete browsing history and cookies
	 (2) (2)	HomeGroup Choose homegroup and sharing options Internet Options Change your homepage Manage browser add-ons DW WLAN Card Utility

3. View Network Connections

Control Panel Home	View your basic network information an	d set up connections
Manage wireless networks Change adapter settings Change advanced sharing settings	SRMPC Multiple netv (This computer) View your active networks	works Internet Connect or disconnect
	srm.local Work network	Access type: Internet Connections: att LAN Wireless Internet (SRMAP)
	Nicht identifiziertes Netzwerk Public network	Access type: No network access Connections: 🔋 Lan
	Change your networking settings	
	Set up a new connection or network Set up a wireless, broadband, dial-up, ad h	oc, or VPN connection; or set up a router or access point.
	Connect to a network Connect or reconnect to a wireless, wired,	dial-up, or VPN network connection.
	Choose homegroup and sharing options Access files and printers located on other r	network computers, or change sharing settings.
	Troubleshoot problems	get troubleshooting information.



4. Properties

eneral	
Connection	
IPv4 Connectivity:	No network access
IPv6 Connectivity:	No network access
Media State:	Enabled
Duration:	05:02:28
Speed:	100.0 Mbps
Activity	
Sent —	Received
Packets: 1,264	+ 0



5. Internet Protocol Version 4 (TCP/Ipv4)

an Properties		
Networking Sharing		
Connect using:		
Broadcom Net)	treme Gigabit Ethernet	#2
This connection uses	the following items:	Configure
Client for Mic	rosoft Networks	
QoS Packet	Scheduler	
File and Print	er Sharing for Microsoft	Networks
Broadcom Av	dvanced Server Progra acol Version 6 (TCP/IP)	m Driver
Territoria de la construcción de la		
Internet Prote	ocol Version 4 (TCP/IP)	(4)
Internet Prote Link-Layer T	ocol Version 4 (TCP/IP) opology Discovery Map	per 1/O Driver
 ✓ Internet Prote ✓ Unk-Layer To ✓ Unk-Layer To 	ocol Version 4 (TCP/IP opology Discovery Map opology Discovery Res	per 1/O Driver ponder
Install	opology Discovery Map opology Discovery Map opology Discovery Res Uninstall	per 1/O Driver ponder Properties
Install Description Transmission Contra	opology Discovery Map opology Discovery Map opology Discovery Res Uninstall	per 1/O Driver ponder Properties
	opology Discovery Map opology Discovery Map Opology Discovery Res Uninstall of Protocol/Internet Pro protocol that provides of	per 1/0 Driver ponder Properties tocol. The default
Install Description Transmission Contr wide area network across diverse inter	opology Discovery Map opology Discovery Res Uninstall of Protocol/Internet Pro protocol that provides of connected networks.	per I/O Driver ponder Properties tocol. The defaul



6. Use the following IP address

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Conr	Network	ing Sha	pring			_	
IF	C Inte	ernet Pro	otocol Version 4 (TCP/IP	v4) Properti	es		8 2
IF	1	General	Alternate Configuration				
s	n	You can this cap for the a	get IP settings assigned a ability. Otherwise, you ner appropriate IP settings.	utomatically in ed to ask your stically	f your r netwo	network ork admir	supports nistrator
		Us	e the following IP address:	(con y			
Activ		IP ad	dress:				
		Subn	et mask:				
		Defa	ult gateway:	1	141		
		Ob	tain DNS server address a	utomatically			
		O Us	e the following DNS server	addresses:			
		Prefe	rred DNS server:	· •	(4)	14	
	4	Alter	nate DNS server:				
		Va	alidate settings upon exit			Adv	/anced



7. IP address: 192.168.0.89

Tor	que Analysis Box Properties	23	
nne Net	adrina (CI +		
IPV Ir	ternet Protocol Version 4 (TCP/I	Pv4) Properties	8
Me	General		
Dui	Very set the setting and set		
Spe	this capability. Otherwise, you ne	ed to ask your network adminis	trator
	for the appropriate IP settings.		
	💿 Obtain an IP address autom	atically	_
	Use the following IP address	:	
uvie	IP address:	192.168.0.89	
	Subnet mask:	255 , 255 , 255 , 0	Î.
Pac	Default gateway:	345 (A 16	
	🕐 Obtain DNS server address	sutomatically	
<u>9</u> F	Use the following DNS serve	r addresses:	
-	Preferred DNS server:	148 39 8	li -
	Alternate DNS server:		Ì.
	Validate settings upon exit	Advar	nced
		Auvoi	ICCU.

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

		Locatio	n: Automatic		÷.	
0	Ethernet Connected	«• »	Status:	Connected	Turn Wi-Fi Off	
•	Wi-Fi Connected	÷		Wi-Fi is connected to address 192.168.10.	srm.it3 and has the IP 226.	
•	MBBEthernet Not Connected	~~ >	Network Name:	srm.it3	\$	
0	ArduinSerial 2 Not Configured	Cros		Ask to join new networks Known networks will be joined automatically. If no known networks are available, you will be asked before joining a new network.		
•	ArduinB-Serial Not Configured	Cron				
0	Bluetooth DUN Not Connected	8				
•	FireWire Not Connected	¥				
•	iPhone Not Connected	~~ >				
0	TomTom Not Connected	~~>	_			
L	- * *		Show Wi-Fi status	in menu bar	Advanced (7	

3. Set the IP Address under Ethernet

	Location.	Automatic		Ŧ
Ethernet Connected	<u></u>	Status:	Connected	Turn Wi-Fi Off
Wi-Fi Connected	<u></u>		Wi-Fi is connected to address 192.168.10.	srm.it3 and has the IP 226.
MBBEthernet Not Connected	<>	Network Name:	srm.it3	\$
ArduinSerial 2 Not Configured	Cur		Ask to join new networks Known networks will be joined automatically.	
ArduinB-Serial Not Configured	Con		If no known networ be asked before joir	ks are available, you will ning a new network.
Bluetooth DUN Not Connected	8			
FireWire Not Connected	¥			
Not Connected	600			
TomTom Not Connected	<>	3		
iPhone Not Connected TomTom Not Connected	600) 600)			

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

200	SRM Ergo	meter Software		- 🗆 🗙
File Settings ?				
👭 Athletes 🛛 🕍 Workout	🍥 Test 🛛 💏 Activities 🤞	File Transfer 🔅 Settings	🔣 Log	SRM ERG
	letwork Chart Test Ergometer			
	Workd	ut / 30s Chart		
SETTINGS	Show entire Test O Show only the last 00:05	+ hours / minutes		
Welcome to the SETTINGS.	Value Smoothing Factor: 3			
Please set up your network connection to the Ergometer.	Test Chart 30s Chart			
Ĭ	Power [W] 🤍 Visible 🕑 Visible	From: 0 🗘 To: 400	🕑 Auto Color	
As soon as you are connected, you can read	Heartrate [bpm] 🔗 Visible 🔗 Visible	From: 0 🗘 To: 250	🔗 Auto Color	
the Ergometer	Cadence [rpm] 🔗 Visible 🔵 Visible	From: 0 🗘 To: 250	🕑 Auto Color	
settingspage.	Speed [km/h] 🛛 Visible 🔷 Visible	From: 0,00 🗘 To: 100,00	🕑 Auto Color	
For more information about setting up the	Torque [Nm] 🔗 Visible 🔵 Visible	From: 0,00 🗘 To: 99,00	🕑 Auto Color	
Drop file here to import	Dev	ation Chart		
Settings	Percent of target value: +/- 30 %	Color 10% Color 20%	Color 30%	

In this menue 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

<u>2011</u>	SRM Ergometer Software - 🗖					
File Settings ?						
Athletes 🕍 Workouts	🜔 Test	of Activities	📥 File Transfer	🔅 Settings	E Log	SRM
Relations to the SETTINGS SETTINGS Welcome to the SETTINGS. Please set up your network connection to the Ergometer. As soon as you are connected, you can read the system information on the Ergometer settingspage. For more information about setting up the Drop file here to import Settings	etwork Chart Test Start Test by Cac Stop Test by no Save data automatica Control test with Pov	Ergometer Jence Start Bu Cadence Start Bu Jily at test end verControl keys	tton			

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

SRM Ergometer Software					
File Settings ?					
🚇 Athletes 🛛 🕍 Workou	ts 🜔 Test	🔥 Activities 🔥 File Transfer 🔅 Settings 📃 Log	SRM ERG		
	Network Chart Tes	t Ergometer			
	Slope 15	0 Hz/Nm (15.0 - 50.0)			
SETTINGS	Zero Offset 10	Hz (100 - 1000)			
Welcome to the CETTINCC	Circumference 50	mm (500 - 5000)			
welcome to the SETTINGS.	Firmware: -				
Please set up your network connection to the	Hardware: -				
Ergometer.	Product code: -				
As soon as you are	Serial number:				
connected, you can read the system information on	Operation time: -				
the Ergometer settingspage.	Read Settings	Write Settings			
For more information					
about setting up the					
Drop file here to import Settings					

Slope

The slope in the ergometer software must be 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 lables 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 "**S**RM **F**irmware **I**mage" 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

File Settings ?		SRM Erg	gometer Software			- 0 ×
Athletes 🛛 🕍 Workouts	s 🧿 Test	of Activities	📕 File Transfer	🔅 Settings	E Log	SRM
	Add new athlete	🔆 Delete athlet	te		1	Next
SELECT ATHLETE	Athlete ID 1	Last Name Mustermann	First Name Max	Gender Male	Date of birth 01.01.1980	Crank length 150.0
Welcome to the ATHLETE overview. Please select an athlete or						
create a new one and continue to the WORKOUT selector. For more information about Workouts, click <u>here</u> .		Athlete ID: Last Name:				
		First Name: Gender:				
		Date of Birth: Crank length:	01.01.1980 172,5			↓ ▼ ▼
Network not connected						

- 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.

Rohloff gear check

We recommend to verify the gear of thee 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

SRM Ergometer Software – 🗗 🗙						
Athletes 🕍 Workout	s 🧿 Test	K Activities 🛃 File	Transfer 🔅 Settings	E Log	SRM	
†	🙀 Add new workout	🙀 Delete workout	🕍 Export workout	🜌 Import workout	Next	
	Search:					
	Workout	ID	Workout name	Worko	Workout duration	
SELECT WORKOUT	1		Step test, WHO protocol	00:3	9:00	
	2	S	tep test, BAL / DOSB protocol	00:3	36:00	
Welcome to the WORKOUI overview.	3		Step test, WHO protocol	00:4	10:00	
	4	S	tep test, BAL / DOSB protocol	00:3	36:00	
Please select the	5	Step test,	healthy juniors / youth, BDR pr	otocol 01:0)0:00	
to use or create a new one.	6	Step test, ł	ealthy women / juniors, BDR p	rotocol 00:5	57:00	
					i dona	
You can import/export the						
Drop files here to import Workouts	480					
	₹ ⁴⁰⁰				Caden	
	80				ce (rpm)	
Network not connected Version: 1.0.8 - Build date: 20.06.2016						

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

SRM Ergometer Software					
Athletes 🕍 Workd	outs 📀 Test	of Activities	ile Transfer 🔅 Setti	ngs 📃 Log	SRM ERG
FILE TRANSFER FILE TRANSFER To get a list of the FIT files stored on the Ergometer click get file list. The Ergometer stores the last 28 workouts as backup. You can upload new firmware to the Ergometer	Get File List	🛃 Download Activity	T Upload File	Delete File	
Drop files here to upload to Ergometer			0%		

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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