

h/p/cosmos para analysis lt user manual

User manual

h/p/cosmos para analysis LT - version 1.4

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[2.] Warning hints

- This program has been produced to monitor and support fitness, and must not be applied for medical use.
- All advice and data given in this program are optional and must not be applied for sanitary or medical purposes. All advice and data given in this program are non-binding and can be amended by your physician.
- Before using a fitness-test, an exercise machine, a fitness-software and/or a training suggestion, a physician should be consulted.
- Using wrong performance steps or using wrong training durations during exercises, can cause severe injuries or death.
- The present software and the accompanying documents are literary property of h/p/cosmos sports & medical gmbh and of the producer mesics GmbH.
- The customer does not purchase any copy rights of the software and of the accompanying documents. All rights reserved.
- It is forbidden to copy or hand on the software's demo version for the purpose of commercial utilisation. By purchasing the software, the customer gains the right to use the software within the framework of the following regulations. This right is temporally not limited and non-exclusive.
- The complete program must not be installed on more than one data processing device. If the software is installed on more than one server or PC, an additional user license for each workstation, where the software has been installed or used, must be bought from h/p/cosmos.
- The user may not change the software, i.e. it is particularly forbidden to interpret, to disassemble, to decompile, to reprogram or to reverse engineer the software in any kind. Further, it is forbidden to extract any program elements.
- The user may make a backup copy of the software. In doing so the user is in bound to copy alphanumerical identifications, brands, copy right notations or other hints unchanged.
- The documents may only be printed for personal use.
- The purchaser may not make the complete program accessible to a third person, i.e. it is particularly forbidden to hire, to vend, to borrow or to sub-licence the program.
- All programs and documentations have been developed with the utmost care and have been checked for correctness according to the state of the technology. No responsibility or warranty, neither explicit nor implicit, is taken by h/p/cosmos, for quality, capability and merchantability of the product for a purpose that departs from the covered scope of work.
- h/p/cosmos can only be made responsible for damages, that originated from direct or indirect use of the documentation or of the other programs, as well as for incidental damages or consequential damages, in case of intention or of gross negligence. All liability claims are expressly excluded in case of loss or damage from hardware, software or data as a result of direct or indirect damages or demolition. All liability claims are as well expressly excluded for charges, including costs for telephone connections, that were made in conjunction with the delivered programs and documentations, and charges for erroneous installations that were not made by h/p/cosmos.
- All information contained in the documentations and all associated programs can be altered for the purpose of technical progress. All liability is excluded in case of damages, that originated from the use of this program.
- The program is delivered „as is“ without any guarantee. No guarantee is given for the program, neither explicit nor implicit. The buyer bears the full risks in matters of the program's quality and capability. If the program turns out to be erroneous, the buyer bears all costs for the necessary services, reparation or correction.
- The licensor, or any other party, that may change and/or deploy, will in no case be liable for defects, except stipulated by applicable law or covenant in written form. The licensor will in no case be liable for any, general, specific, accidental defects or consequential damages, that originate from the use of the program or from the

disqualification to apply the program (erroneous data, infraction of the program by junction with another program etc.), even if the beneficiary or another party has been pointed to the eventuality of those damages.

[3.] **Intended use**

The program has the purpose to monitor and support fitness and may not be used for medical, rehabilitative or scientific applications.

[4.] **Prohibited use**

The software may not be used for any medical, rehabilitative or scientific applications.

[5.] Registration

h/p/cosmos para analysis LT can be downloaded on the internet. By registration of your personal data online, the program can be licensed and released to the complete program.

As h/p/cosmos para analysis LT is an inexpensive program, no cost-free support can be granted. Please direct your inquiry concerning charges for support to h/p/cosmos or your responsible speciality retailer.

The free download of the demo version contains all essential functions necessary for the step test analysis, the print function however is disabled. The demo version has the purpose to give an impression of the software's capability. A commercial use and/ or an institutional use of the demo version longer than the stated interval of the test period is prohibited.

Please pay attention to regulations concerning rights and options as well as to warnings and to the software's use in the license terms and advices concerning the software's installation and start.

[5.A] Licensing

After starting the demo-version you can set up of your required version. The menu „Options / Registration“ (right bottom of the page) will lead you through all necessary steps.

Possibility 1) Buy the Software via PayPal

You can buy the product at www.h-p-cosmos.com via the PayPal system. You simply need your own PayPal account.

After successful transaction, h/p/cosmos will send you an automatically generated license key to the email-address you have entered on PayPal. Now fill in the following information into the software h/p/cosmos para analysis LT by choosing "Program options / License"

- your personal data (at least the name of the institution)
- the email-address you have entered on PayPal
- the PayPal transaction code
- the license key you received via email

Afterwards press „activate license“.

Possibility 2) Registration

If you do not like to buy the product via PayPal, proceed as follows:

Fill in the following data into the software h/p/cosmos para analysis LT at „Program options/ license“:

- all required personal data
- your email address

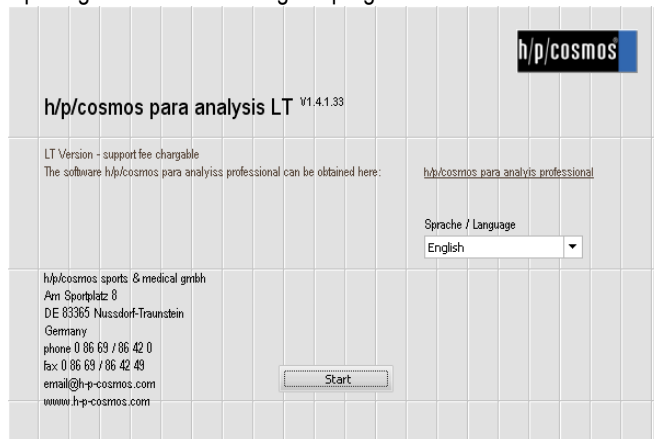
Afterwards, press "registration", choose the preferred registration type and press „Register“. After sending the registration data, and after the data has been checked, you will receive the license code from h/p/cosmos. You may use the software free until you receive the license.

After receiving the license, fill in the key into „licence code“ and press „activate license“.

Possibility 3) Activation code

In case you received a CD of the program, you can license the software via the activation code printed on the CD cover. Choose the option „activation code“ and fill in the requested data. The associated license key will be delivered from h/p/cosmos.

Opening screen after starting the program:



[6.] Program-specific basics

[6.A] Hardware requirements

The software needs about 10 MB fixed-disk storage. A screen resolution of 1024 x 768 pixels is a prerequisite. The font size has to be adapted to 96 dpi in the display settings of windows.

[6.B] Software compatibility

- h/p/cosmos sirius (LACTATE SCOUT) lactate analyzer (via RS 232 or USB interface)
- export of graphics into the bitmap graphics format
- export of reports into Adobe Acrobat PDF-format

[6.C] Single user installation

In order to install the software you simply need the setup data. These can be taken from the demo-CD (CD drive required) or from the internet. Start the installation by clicking on the file „Setup_hpcosmos_para_analysisLT.exe“. The program will be installed in the h-p-cosmos folder on the system's partition (drive C:\). h/p/cosmos para analysis LT has been developed for the following operating systems:

Windows 2000 / XP / VISTA / Windows 7

During the installation, no driver will be installed and no changes on system-files will be made.

[6.D] Installation on several computers

In case of a network installation of h/p/cosmos para analysis LT the following constellation is common: h/p/cosmos para analysis LT will be installed on a client PC. The „Files“ directory, that will be created by the installation and by the first start of the PC, can be copied or moved onto a database server. The target directory of the server has to be released by the administrator for writing and reading for all clients. h/p/cosmos para analysis LT will be installed on any further PC. Into the program options of h/p/cosmos para analysis LT the connection to the DB server will be indicated as data base path (see chapter basic attitude „program options“). The registration has to be made on each single user PC.

[6.E] Operation

The disk space, that will be used by the data base depends on the number of test data. The data base can be copied onto a server drive (see above). This is useful for a backup solution.

[6.F] Backup

The user is responsible to backup the data. Data backup should be made as often as possible (about daily). To simply backup the actual step test data, it is sufficient to create a copy of the Files-directory. C:\h-p-cosmos\data\h-p-cosmos para analysis LT\Files“

Attention!

Data loss will occur, if you do not backup data regularly and if you do not proof regularly that the savings are working properly. h/p/cosmos by no means takes over liability for damages and/ or subsequent damages as a result of data loss.

[7.] Operating instructions

It is quite easy to learn the operation of the present software h/p/cosmos para analysis LT. Neither a wider Computer knowledge nor experiences in the evaluation of lactate tests are necessary.

If you like to use more than the here mentioned functions of the program, we recommend to use the software „h/p/cosmos para analysis pro“.

Designations

The terms „test“, „performance test“, „lactate test“ and „step stest“ will be used synonymous.

[7thA] PAGE „DATA INPUT“ - To load and to evaluate an already stored test

Activate on the first page „data input“ the button „load“ to load and to evaluate an already stored test. Choose the file you like to open. Sample tests are included in the demo version.

Click on „ok“ in the data dialog, to load the chosen test.

[7thB] PAGE „DATA INPUT“ – To save a performance test

If you enter a test, you can store the data in a file. For this, click on the button „save“. The program will suggest a file name, but you are free to change it.

[7thC] **PAGE „DATA INPUT“ – To enter test information**

On the upper left page, test information concerning test date, notes, resting heart rate („rest HR“) and resting lactate will appear.

[7thD] **PAGE „DATA INPUT“ - To enter master data**

On the upper right page, test information concerning the test person will appear: Name, first name, gender, weight and date of birth.

[7thE] **PAGE „DATA INPUT“ – To enter measured values**

In the box „measurement values“, that is located on the left margin, you will find the adjustment for the physical load unit. This is, either

Example running-application

- a) km/h (speed in kilometer per hour)
- b) m/s (speed in meter per second)
- c) mph (speed in miles per hour)

Example bike-ergometer-application

- d) Watt (performance)

As well, you may adjust the step duration (in minutes and seconds). If the test person will abort the load during the last step, choose the termination time from that part.

On the bottom left, you will find the possibility of adding the measured values in the grid.

The measured values are:

- a) Step performance (km/h or m/sec or mph or Watt)
- b) Lactate level at the end of the step test

(an alternative to a manual entry of lactate data is described on the next page „read in lactate data from h/p/cosmos sirius“)

- c) Heart rate at the end of the step
- d) Borg value at the end of the step

(subjective parameter to establish a self-assessment by the test person concerning the hardness of the load)

- e) Comment

(individual to step, for example „chest strap has loosened“ or „interruption“)

For a conventional step test, please fill in at least four steps into the grid. You may add or delete steps under the grid by using the correspondent buttons.

[7thF] **PAGE „DATA INPUT“ – read in lactate data from h/p/cosmos sirius**

Choose the button „read lactate values“. A window will appear. At first, choose on the bottom left the correct interface (see the device's user instructions). Click one-time on „search COM“. By doing so, all of the computer's interfaces will be searched and listed. Then adjust the right port. Afterwards, click on „connect“ on the upper left. If the connection is successful, a sound appears. Then click on „read out data“.

Now the lactate values are transferred of the device's memory and presented in the list on the left. Thereby, the lactate values are summarized to tests. However, this requires that you have assigned the lactate values to a test during taking the lactate sample (see the device's user instructions).

Choose the test you like to import and click on OK.

The lactate values are now displayed in the grid „measured value“.

[7thG] PAGE „DATA INPUT“ – evaluate UKK Walking Test

The UKK Walking Index calculator of h/p/cosmos para analysis LT will calculate a value between 60 and 140 (with an average index about 100) on basis of the following data: your time needed for 2000 m, heart rate, age, size and weight. The calculated value can be used for basic assessments of performance diagnostics. The calculation of the UKK Fitness Index is based on the following formula:

Men

$$\text{Index} = 420 + \text{age} * 0,2 - (\text{time} * 0,19338 + \text{pulse} * 0,56 + \text{BMI} * 2,6)$$

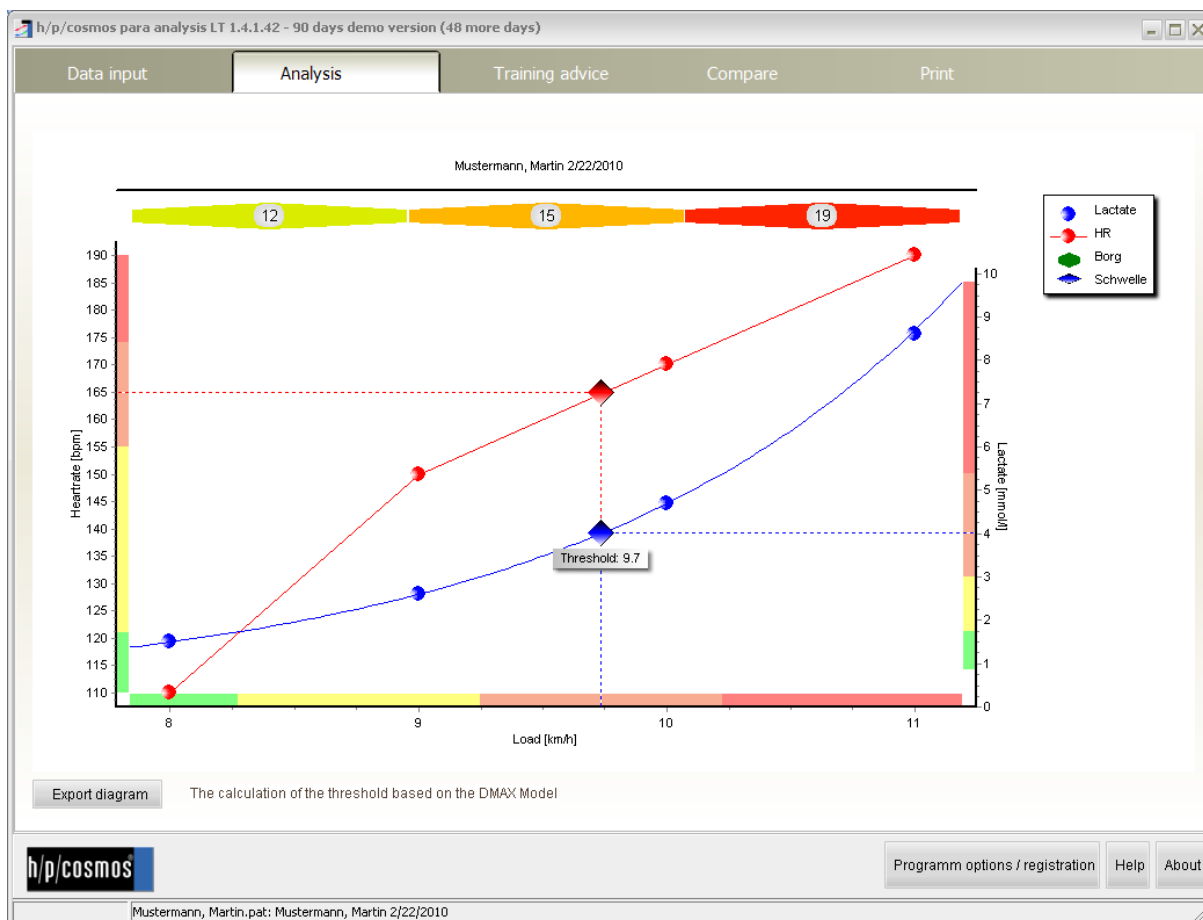
Women

$$\text{Index} = 304 + \text{age} * 0,4 - (\text{time} * 0,1417 + \text{pulse} * 0,32 + \text{BMI} * 1,1)$$

$$\text{BMI} = \text{weight} / \text{size}^2 / \text{age in years} / \text{time in seconds} / \text{pulse in beats/min}$$

You may print the result or convert it into a PDF-file by clicking on the button „print“.

[7thH] PAGE „ANALYSIS“ – view analysis diagram



On this page you will find the results of the analysis graphically summarized, that are based on the data you have entered on the page „data input“. Lactate curves, pulse curve as well as the anaerobic threshold and pulse areas are displayed.

The calculation of the anaerobic threshold is based on the extended DMax method. For the curve fitting, the extended exponential regression algorithm is used ($\text{lactate} = c_0 + c_1 * \exp(c_2 * x)$).

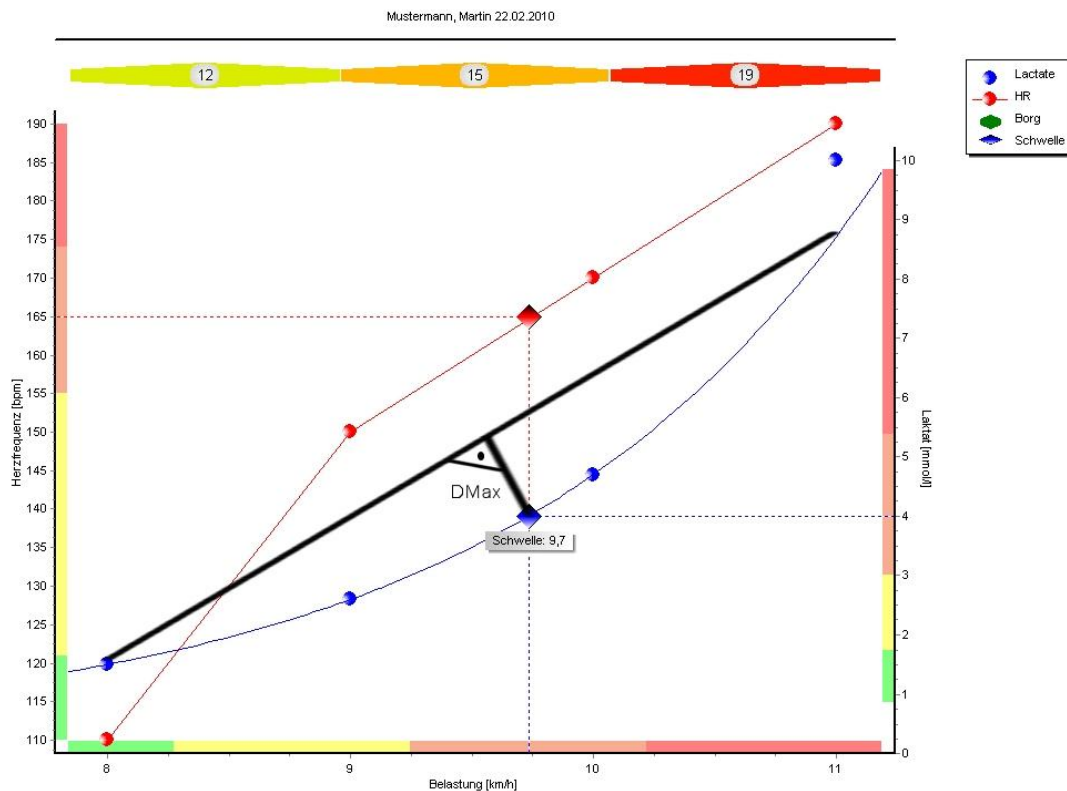
On page 19 and 20 you find literature reference to the threshold model DMax used.

Note:

The original Dmax model has been expanded in this software. Not the first and the last measured lactate value has been used for the evaluation of the secant formula, but the lactate value that has been mathematically defined (deduced) out of the exponential fitting curve on minimum and maximum load. This was performed to relativate the essential influence of the minimal and the maximal measured value of lactate to the result.

Thus, a stable result, that refers to all measured values, will be created for the calculation of the lactate threshold.

Illustration for DMax:



„The calculation of the individual thresholds on basis of the DMax model take place at first by determining a help secant between start load and maximum load in the step test. The major, vertical distance between lactate curve and help secant is generally described as DMax. The intersection between this perpendicular and the lactate curve describes the individual anaerobic threshold according to the DMax model.“

[7th] PAGE „TRAINING ADVICE“ – View training areas

h/p/cosmos para analysis LT 1.4.1.42 - 90 days demo version (48 more days)

Data input Analysis **Training advice** Compare Print

Recommended training intensities ☐ Edit grid manually

Ranges	Temperate zone	Endurance zone	Threshold zone	Anaerobic zone
Heart rate [bpm]	< 121	121 - 155	155 - 174	> 174
Lactate [mmol/l]	< 1.7	1.7 - 3.0	3.0 - 5.4	> 5.4
Load [km/h]	< 8.3	8.3 - 9.2	9.2 - 10.2	> 10.2

Legend:
 Temperate zone: extensive load
 Endurance zone: intensive load
 Threshold zone: development zone, competition load
 Anaerobic zone: only time limited loading possible

All training recommendations can be edited and updated and are subject to a confirmation through your personal physician.

Training advice

h/p/cosmos

Programm options / registration Help About

Mustermann, Martin.pat: Mustermann, Martin 2/22/2010

The page „training advice“ contains the training areas, that has been gained from the analysis, and the recommended training comments.

For the common 4 training areas, pulse limits, lactate limits as well as load limits are shown.

NOTE:

The areas recommended here, purely base on mathematical algorithms and require a medical check and, if necessary, a correction by a diagnostician. For this, the table including load areas and pulse areas can be corrected manually.

Give your test person an individual training recommendation in written form. Chart this into the underlying free description field.

This program has been produced to monitor and support fitness, and must not be applied for medical use.

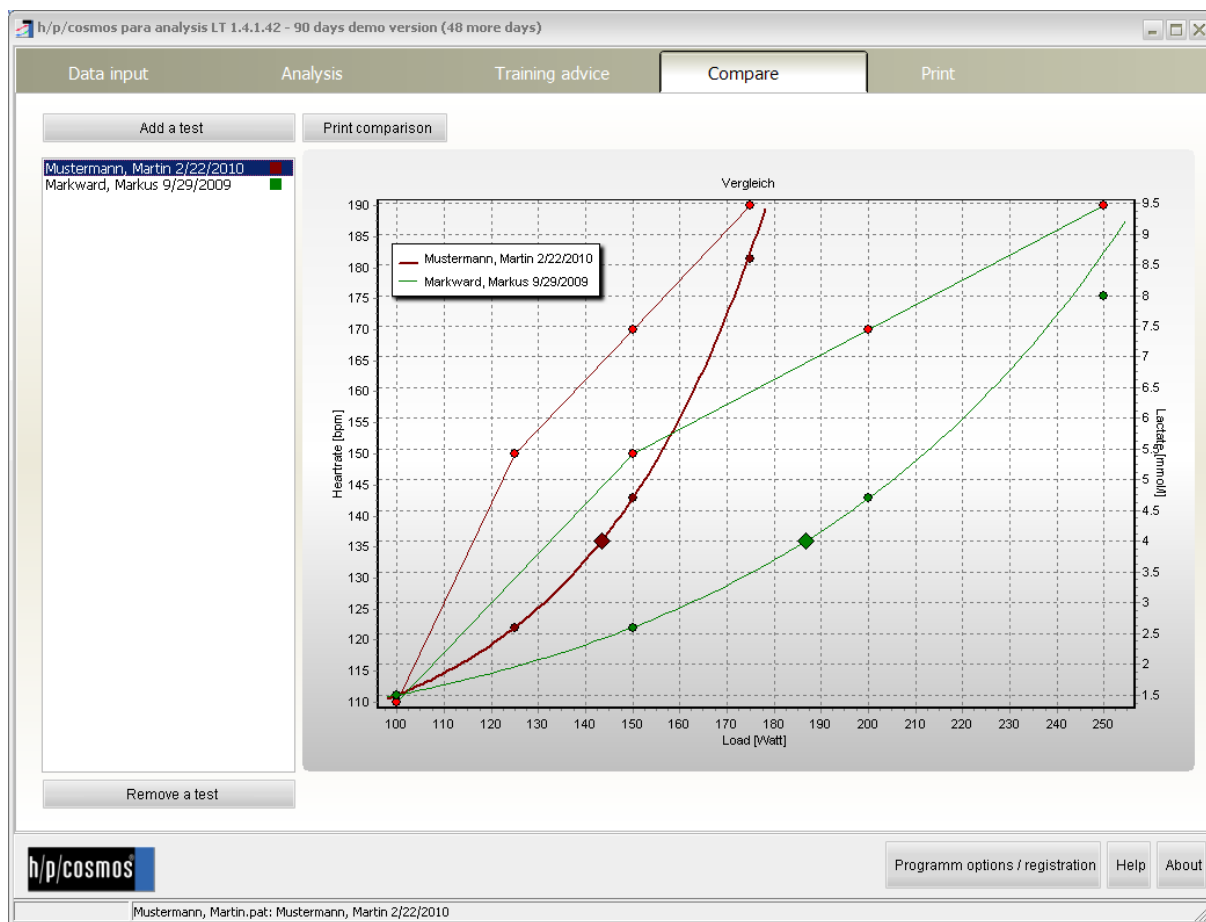
All advice and data given in this program are optional and may not be used for sanitary or medical purposes. All advice and data given in this program are not binding and can be amended by your physician.

Warning!

Please consult a physician before using a fitness test and/or a fitness machine and/or software and/ or training recommendation.

Using wrong performance steps or wrong training durations during exercises can lead to severe injuries or to death.

[7.J] PAGE „COMPARE“ – Compare tests



Here, you can graphically compare the present performance test with other tests. For doing so, add further, already existing data by using the button „add a test“ via file dialog. The new test will be shown in the list on the left.

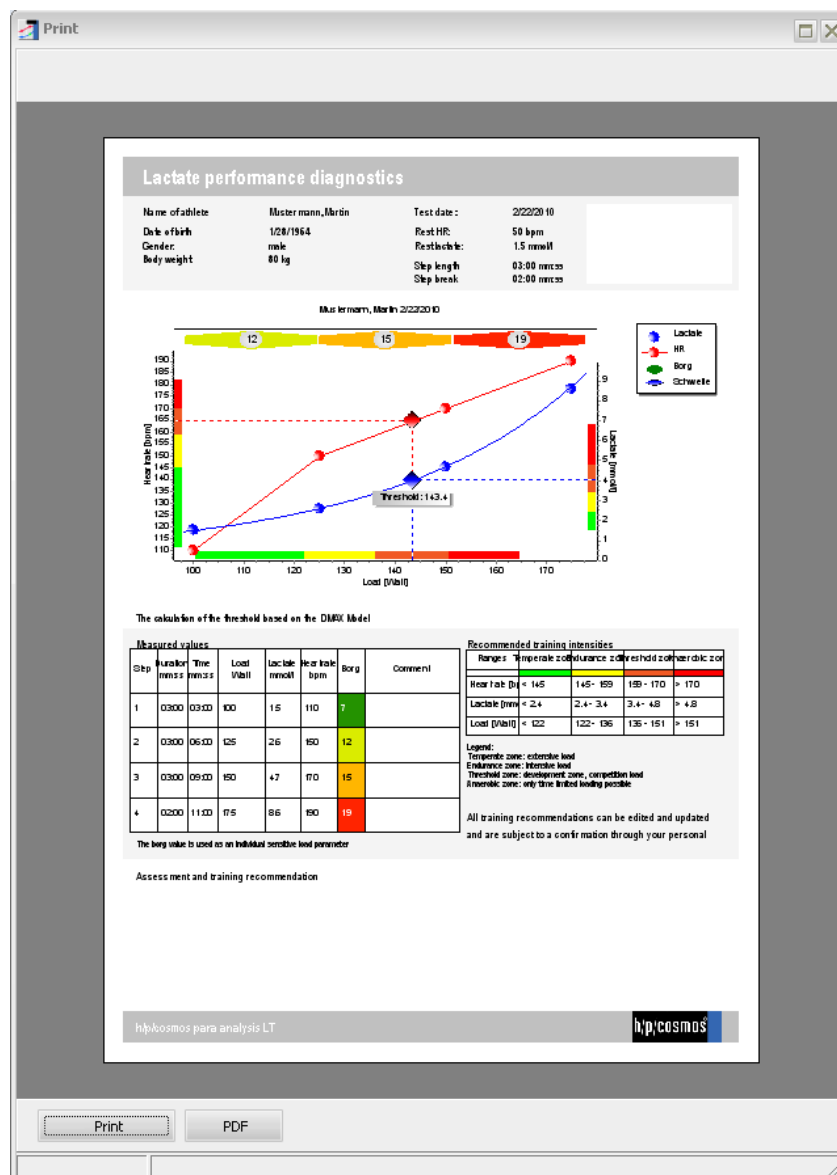
Use the button „remove a test“ to delete a performance test from the list.

If you like to see details of a test, choose a test from the list above and choose the previous main page „data input“, „analysis“ or „training advice“.

The lactate curve, pulse curves as well as the individual anaerobic threshold are represented in the graphic. Two curves of one colour belong to one test. The caption refers to the correct allocation.

You can print the graphic any time by clicking on the button „print comparison“.

[7.K] **PAGE „PRINT“ – Print out results**



On this site, you can print the results of the current chosen performance tests. To start the printing directly, click on the button „print...“. The standard print options dialog will appear.

If you prefer a print preview or if you like to create a PDF, click on the button „preview, pdf...“.

[8.] **Alternative program versions**

As a specialist for treadmill-ergometers and, hence, for the associated systemic solution, h/p/cosmos offers a range of software products for professional use:





You will find an overview of all software products of h/p/cosmos on the internet at:

www.h-p-cosmos.com/de/software/index.htm

Basically, there exists two more alternatives to h/p/cosmos para analysis, that include an enhanced range of functions and an enhanced database.

h/p/cosmos para analysis standard

Order number: cos14710

h/p/cosmos para analysis professional

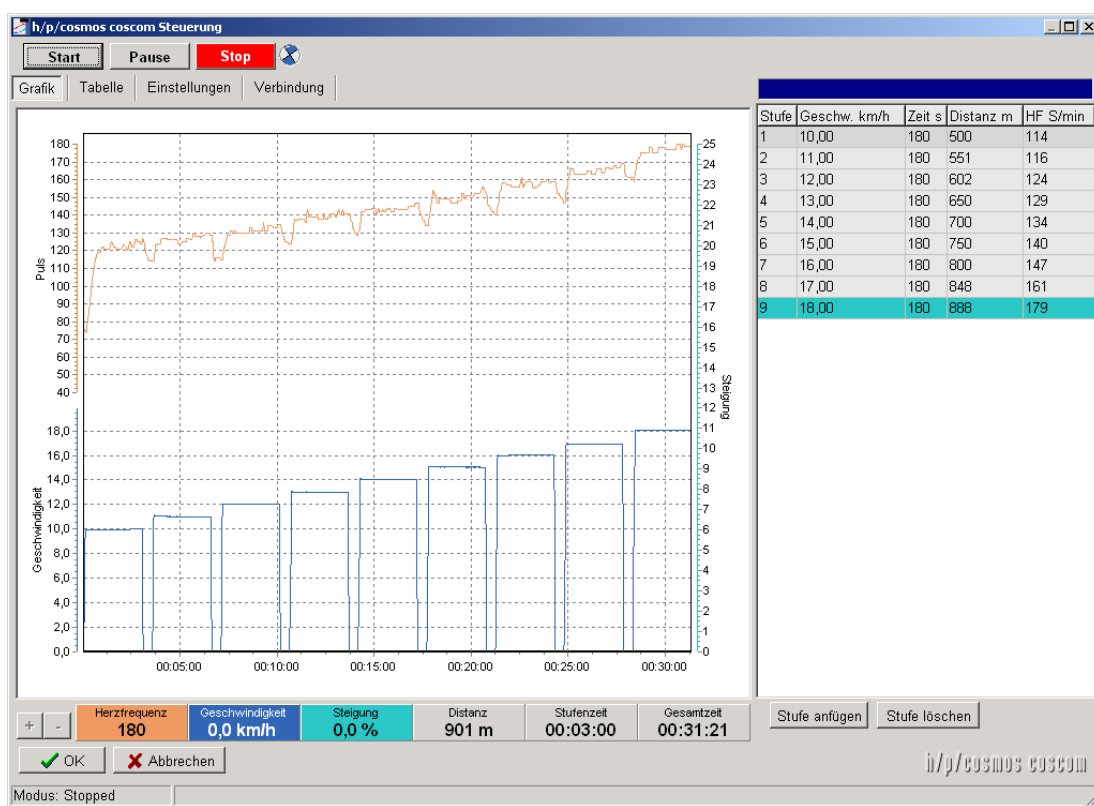
Order number: cos14708

Following, some examples of function and screenshots of h/p/cosmos para analysis 2.0 professional

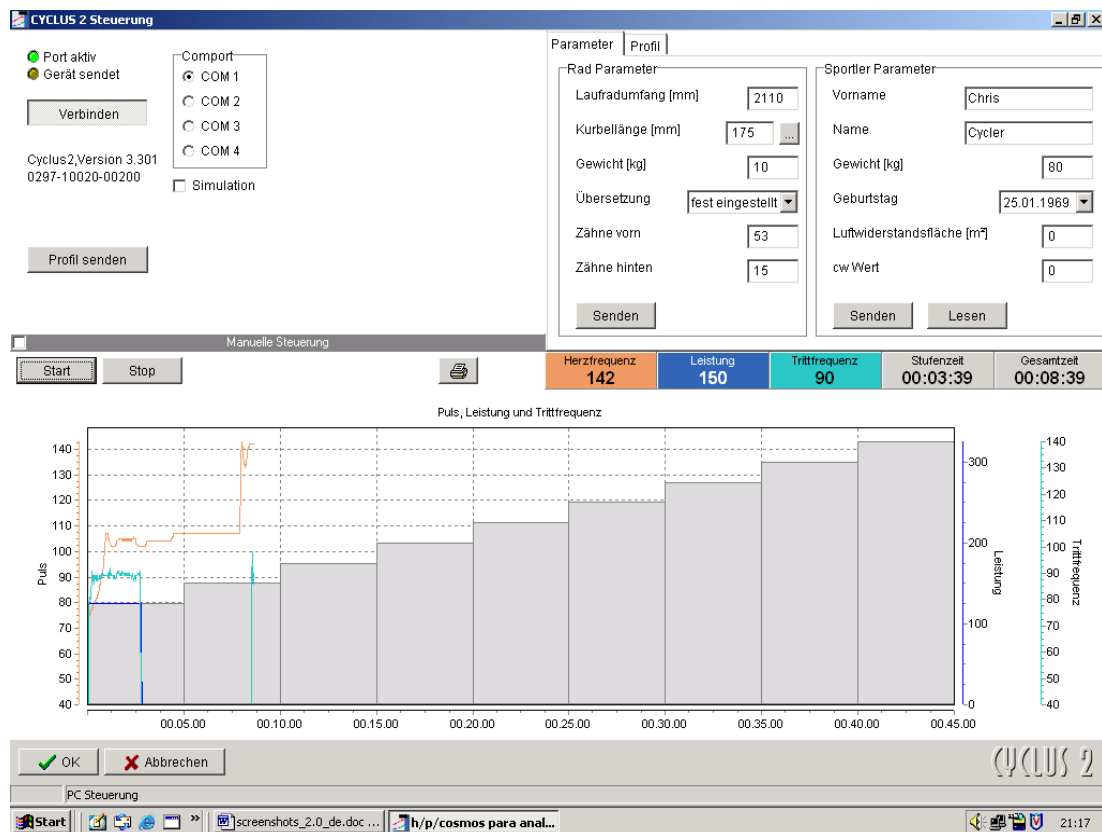
- Test methods
- ergometer, field test, running, rowing, swimming, walking
- Test profiles:
- Within one test method, various individual test profiles for different sports and levels can be created. The test profiles that has been defined here, could then, for example, be transferred to the control of the treadmill-ergometer (coscom-protocol) or to the module CYCLUS 2
- 11 threshold models:
- free Winkel model, free Freiburg, Mader model, Geiger-Hille treadmill model, free fix threshold model, Dickhuth model, Conconi model, Stegmann threshold, individual aerobic threshold, Senkentest threshold, mixed threshold model
- control treadmill-ergometer (coscom-protocol)
- control CYCLUS 2 high performance ergometer
- control of some bicycle ergometer types
- transfer lactate values (h/p/cosmos sirius, LactateScout, Lange LP20)
- transfer heart rate data (POLAR pulse watch)

- load data
- evaluation thresholds
- evaluation training areas
- evaluation graphic
- evaluation energy balance
- evaluation recreation value
- evaluation measurement types correlation
- evaluation report and print
- training plan basics
- training plan units
- training plan overview

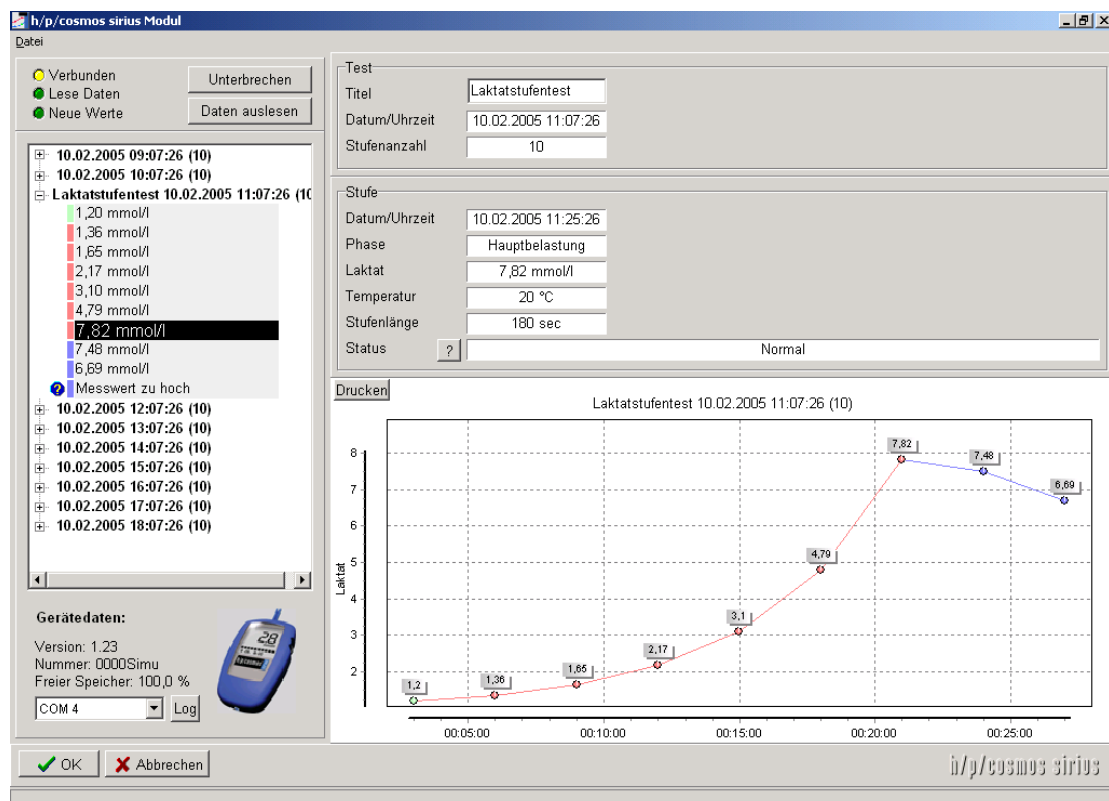
Screenshot: control of the h/p/cosmos treadmill-ergometer from the h/p/cosmos para analysis 2.0 professional



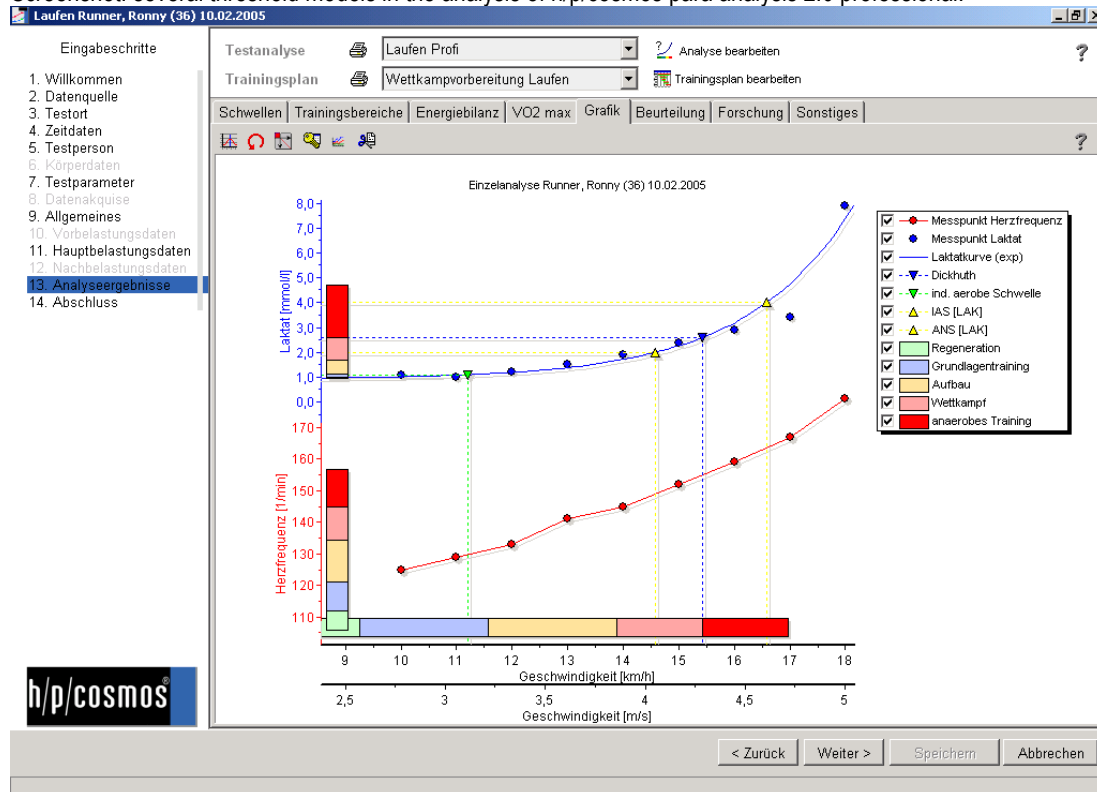
Screenshot: control of the CYCLUS 2 ergometer from the h/p/cosmos para analysis 2.0 professional



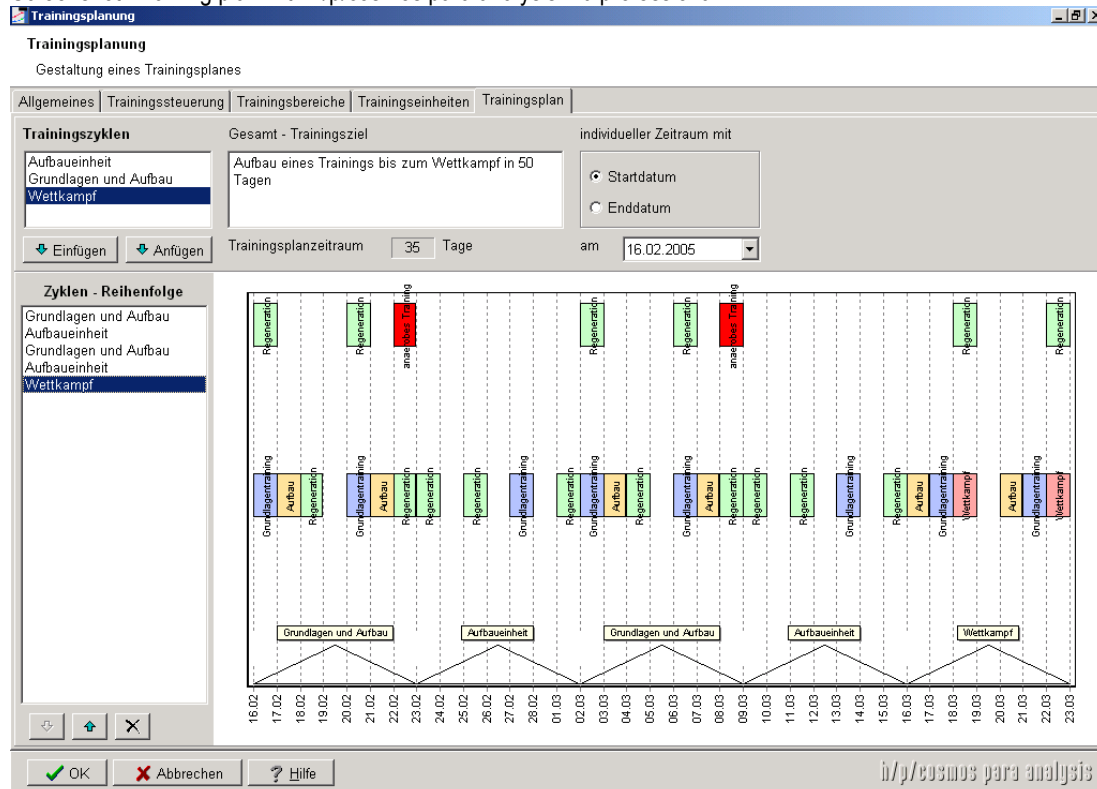
Screenshot: Import of lactate data from the lactate analyser sirius or from Lactate Scout:



Screenshot: several threshold models in the analysis of h/p/cosmos para analysis 2.0 professional:



Screenshot: Training plan with h/p/cosmos para analysis 2.0 professional:



Trainingsplanung
Gestaltung eines Trainingsplanes

Allgemeines | Trainingssteuerung | Trainingsbereiche | Trainingseinheiten | Trainingsplan

Definition | Tabelle

Liste der Trainingsbereiche

Regeneration ☐
 Grundlagentraining ☒
 Aufbau ☐
 Wettkampf ☐
 anaerobes Training ☐

Einfügen Anfügen Löschen
 Liste importieren Liste exportieren

Eine Auflistung aller Trainingsbereiche, die in diesem Protokoll verwendet werden. Es können Trainingsbereiche eingefügt, angefügt oder gelöscht werden.

☒ Trainingsbereich <Grundlagentraining> aktiv

TB Daten TB Beschreibung Grafik

Bezeichnung Grundlagentraining ID -1

Umfang

Untergrenze 60 %
 Obergrenze 75 %
 Karvonenfaktor 0,6 (0,5 - 0,9)

☐ an aerober Schwelle orientieren

Bezeichnung des Trainingsplans
 Wettkampfvorbereitung Laufen

Bemerkungen
 Der Sportler bereitet sich auf den Münchener Medien Marathon vor.

50 55 60 65 70 75 80 85 90 95 100 105 110

OK Abbrechen Hilfe

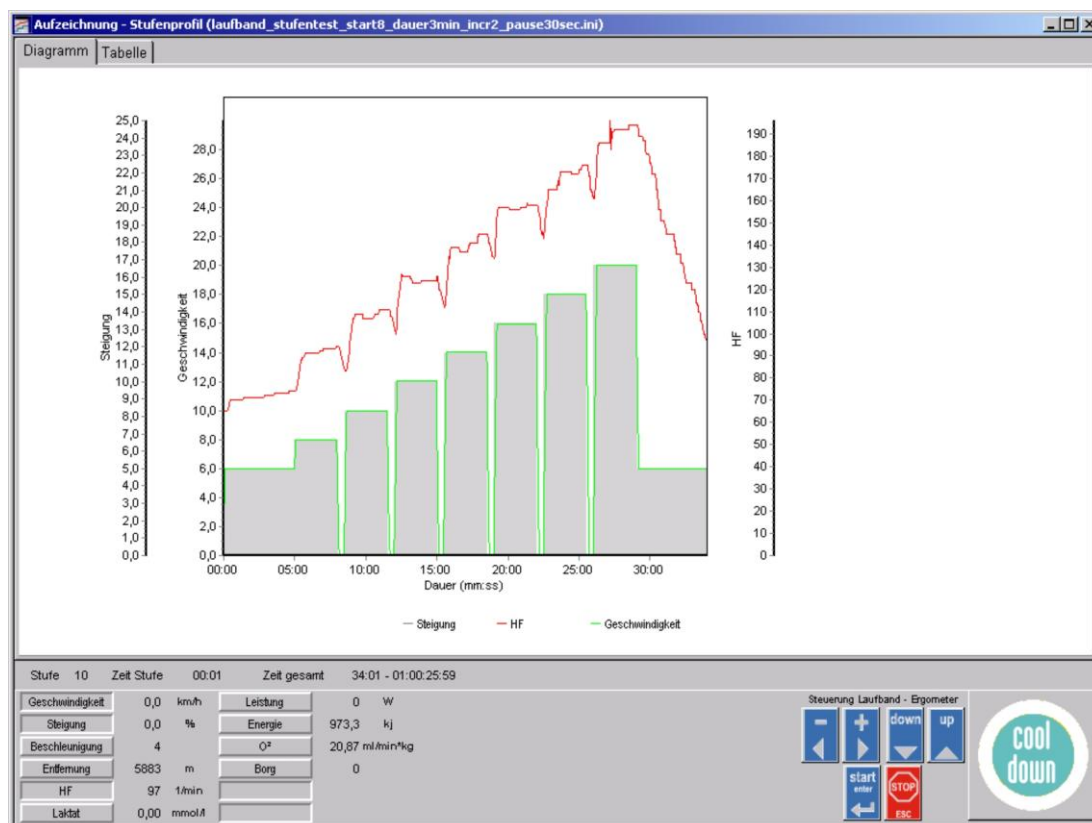
h/p/cosmos para analysis

Alternative program versions

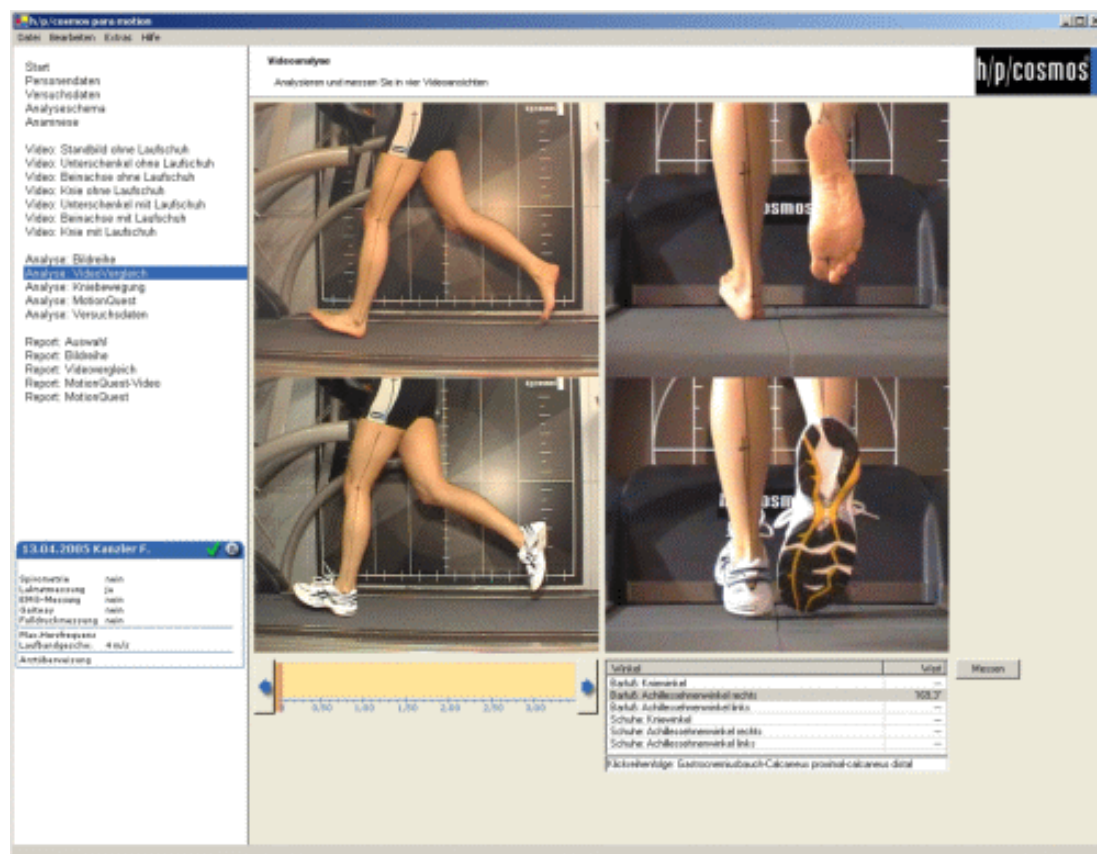
Screenshot: control of the h/p/cosmos treadmill-ergometer from the h/p/cosmos para control (freeware):



Screenshot: control of the h/p/cosmos treadmill-ergometer from the h/p/cosmos para graphics:



Screenshot: control of the h/p/cosmos treadmill-ergometer from the h/p/cosmos para motion



The PC Software [h/p/cosmos para motion](http://cosmos.para-motion.com) serves as motion analysis by use of video cameras.

Errors and technical modifications reserved.

Costs and details to more programs and upgrades of h/p/cosmos are available directly at h/p/cosmos or at an authorised dealer.

[9.] Literature

(1)	CLASING, D.: Sportärztliche Untersuchung und Beratung, Erlangen 1990
(2)	CLASING, D./ WEICKER, H./ BÖNING, D.: Stellenwert der Laktatbestimmung in der Leistungsdiagnostik, Gustav Fischer Verlag, Stuttgart, Jena, New York 1994
(3)	DICKHUTH, H.H./ BERG,A./ LEHMANN, M./ KEUL,J.: Laufband- und Fahrradergometrie im Bereich des Hochleistungssport, Erlangen 1979
(4)	GEIGER, L.V.: Ausdauertraining. Der sportmedizinische Ratgeber, Copress Verlag in der Stiebner Verlag GmbH, München 2001 (3. Neuauflage)
(5)	HECK, H.: Laktat in der Leistungsdiagnostik, Wissenschaftliche Schriftreihe des DSB (Band 22), Schorndorf 1990
(6)	HECK, H./ HIRSCH, L./ HOLLMANN, W./ KEUL, J./ KINDERMANN, W./ LIESEN, H./ MADER, A. /SCHMIDT, P./ TSCHIENE, P.: Ausdauertraining – Stoffwechselgrundlagen und Steuerungsansätze – DSB, Bundesausschuss für Leistungssport, Frankfurt 1977
(7)	HECK, H./ MADER, A./ LIESEN, H./ HOLLMANN, W. : Vorschlag zur Standardisierung leistungsdiagnostischer Untersuchungen auf dem Laufband, Erlangen 1983
(8)	HILLE, C.T./ GEIGER, L.V.: Mathematische Beschreibung der Laktatkinetik beim Stufentest und Umsetzung in eine datenbankorientierte Analysen-Software, Leistungssport 23 (1993), 5, 46-51
(9)	HOLLMANN, W./ Hettinger T.: Sportmedizin. Grundlagen für Arbeit, Training und Präventivmedizin. Schattauer Verlag, Stuttgart 2000 (4. Auflage)
(10)	JANSSEN, P.G.J.M.: Ausdauertraining – Trainingssteuerung über die Herzfrequenz- und Milchsäurebestimmung, Erlangen 1989
(11)	KEUL, J./ SIMON, G./ BERG, A./ DICKHUTH, H.H./ GOERTTLER, I./ KÜBEL, R.: Bestimmung der individuellen anaeroben Schwelle zur Leistungsbewertung und Trainingsgestaltung, Dt. Zeitschrift für Sportmedizin (1979), Heft 7, 212-218
(12)	MÄTTNER, U.: Laktat in der Sportmedizin, Mannheim 1987
(13)	MELLEROWICZ, H./ FRANZ, J.W.: Standardisierung, Kalibrierung und Methodik in der Ergometrie, Erlangen 1983
(14)	SCHÜRCH, P.: Leistungsdiagnostik, Erlangen 1987
(15)	SIMON, G./BERG, A./ DICKHUTH, H.-H./ SIMON-ALT, A./ KEUL, J.: Bestimmung der anaeroben Schwelle in Abhängigkeit vom Alter und der Leistungsfähigkeit, Dt. Zeitschrift für Sportmedizin (1981), Heft 1, 7-14
(16)	STEGMANN, H./ KINDERMANN, W.: Bestimmung der individuellen anaeroben Schwelle bei unterschiedlich Ausdauertrainierten aufgrund des Verhaltens der Laktatkinetik während der Arbeits- und Erholungsphase, Dt. Zeitschrift für Sportmedizin (1981), Heft 8
(17)	STRYER, L.: Biochemie, Spektrum der Wissenschaft Verlagsgesellschaft , 1990
(18)	ZINTL, F./ Eisenhut, A.: Ausdauertraining – Grundlagen, Methoden, Trainingssteuerung, Fünfte, überarbeitete Auflage (Neuauflage), BLV Verlagsgesellschaft mbH, München
(19)	Cheng, B., H. Kuipers, A. C. Snyder, H. A. Keizer, A. Jeukendrup and M. Hesselink. A new approach for the determination of ventilatory and lactate thresholds. International Journal of Sports Medicine 13: 518-522, 1992. O
(20)	VAN SCHUYLENBERGH, R., VANDEN EYNDE, B., HESPEL, P. (2004), Correlations Between Lactate and Ventilatory Thresholds and the Maximal Lactate Steady State in Elite Cyclists. International Journal of Sports Medicine, 25, 403 – 8

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