FiTROdyne Premium

User Manual

I.   INSTALLATION OF THE SYSTEM

Using cable enclosed, connect the unit with the USB port of the PC.

Hook up the kevlar tether of the unit to the barbell or the highest stack of weight exercise machine. Place the unit so that during exercise kevlar line will move in vertical direction.

II. SOFTWARE INSTALLATION AND OPERATION

As a first step USB Drivers for a FiTRONiC diagnostic device must be installed. Follow the instruction according to operation system of your computer (Windows XP, Window Vista, Windows 7). **SHOULD YOU HAVE INSTALLED USB DRIVERS FOR ANY FiTRONiC DEVICE ON YOUR COMPUTER, YOU DO NOT NEED TO REPEAT THE PROCEDURE**. Skip this section and go directly to software operation (RUNNING THE PROGRAM).

1. WindowsXP

Installing Via The Found New Hardware Wizard

To install USB drivers for an, follow the instructions below:

.   •If a device of the same type has been installed on your machine before and the drivers that are about to be installed are different from those installed already, the original drivers need to be uninstalled. Please refer to the Uninstalling USB Drivers section of this document for further details of this procedure.
.   •Download the latest available USB drivers from the FiTRONiC web site (www.fitronic.sk/downloads/downloads) and unzip them to a location on your PC or insert instalation CD into optical drive.
.   •Connect the device to a spare USB port on your PC. The screen shown in Figure 1 is displayed. Select "No, not this time" from the options available and then click "Next" to proceed with the installation.
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Figure 1

.　　　•Select "Install from a list or specific location (Advanced)" as shown in Figure 2 below and then click "Next".
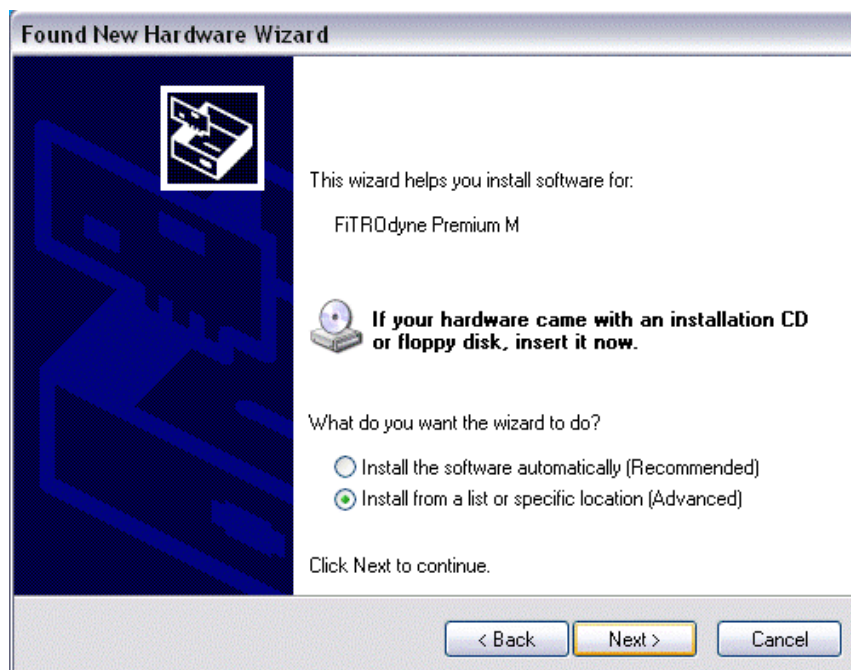

Figure 2

.　　　•Select "Search for the best driver in these locations"
If CD with drivers is inserted, select „Search removable media (floppy, CD-ROM...), or enter the file path in the combobox   ("F:\FiTRO_USB_DRV" in Figure 3 below) or browse

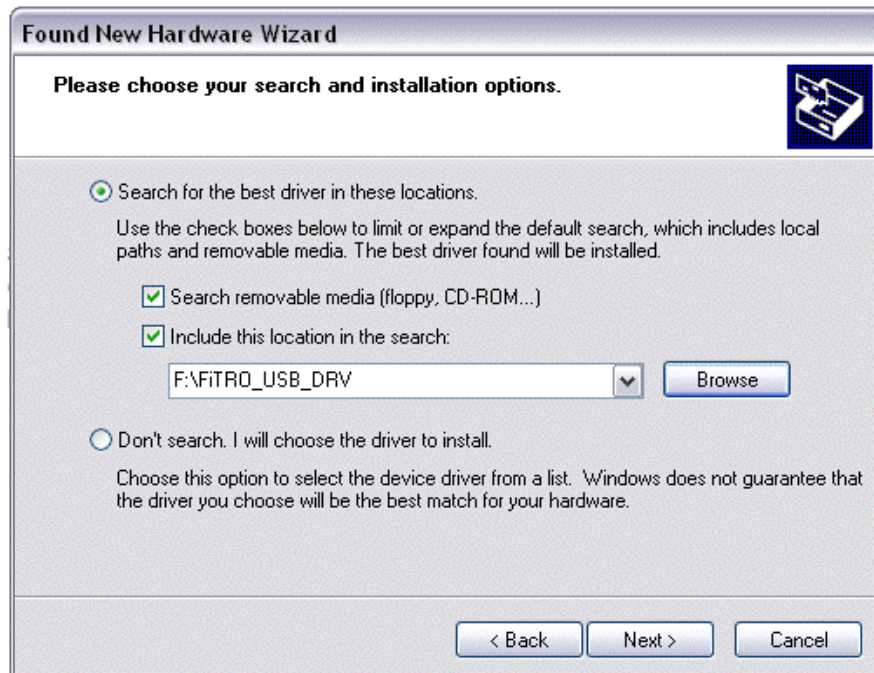to it by clicking the browse button. Once the file path has been entered in the box, click next to proceed.
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Figure 3

.   •If Windows XP is configured to warn when unsigned (nonWHQL certified) drivers are about to be installed, the message dialogue shown in Figure 4 will be displayed unless installing a Microsoft WHQL certified driver. Click on "Continue Anyway" to continue with the installation. If Windows XP is configured to ignore file signature warnings, no message will appear.

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Figure 4

.　　•The screen shown in Figure 5 will be displayed as Windows XP copies the required driver files.
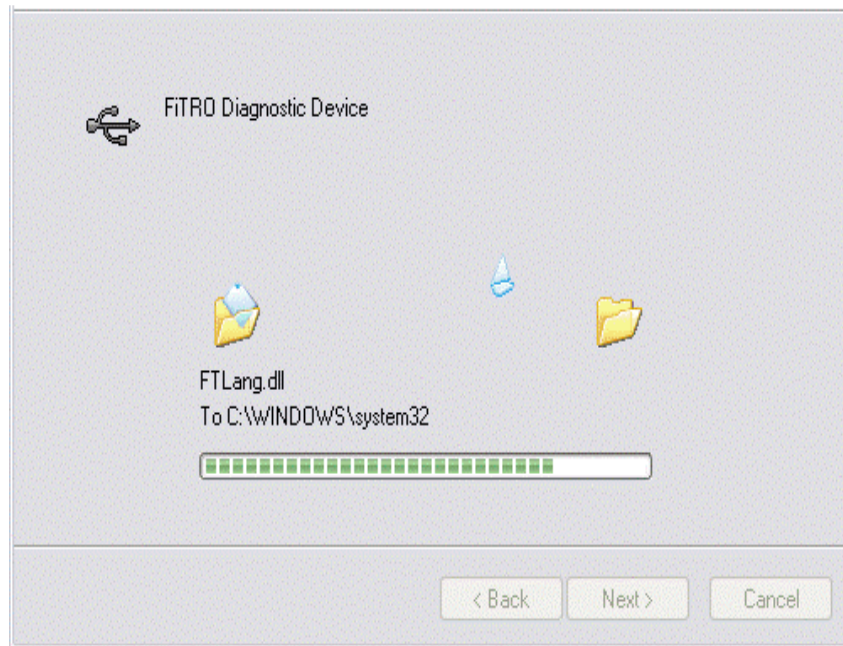.

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Figure 5

.　　•Windows should then display a message indicating that the installation was successful (Figure 6). Click "Finish" to complete the installation for the first port of the device.
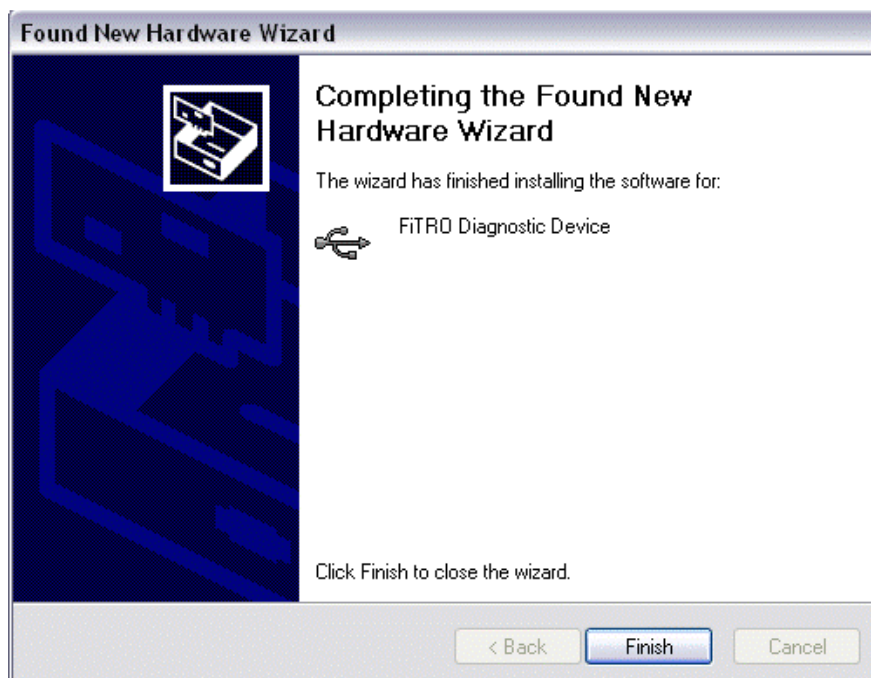.

Figure 6

Uninstalling USB Drivers

•Devices can be removed using the Device Manager by simply right clicking on the device and selecting "Uninstall". This will delete the associated registry entries for that device only. Open the Device Manager (located in "Control Panel\System" then select the "Hardware" tab and click "Device Manger") and select "View > Devices by Connection", the device appears as a "FiTRO Diagnostic Device"

Under Windows XP, driver files and OEM INF and PNF files must be removed manually or by using a custom application. OEM INF and PNF files are located in the Windows\Inf directory and can be identified by searching for a VID and PID string matching the device installed e.g. VID_0403&PID_E198. Once the matching OEM INF files are found (e.g. oem10.inf for FTDIBUS.INF), the corresponding PNF files must also be removed (e.g. oem10.pnf and oem11.pnf). Driver files are located in the Windows\System32 and Windows\System32\Drivers directories.
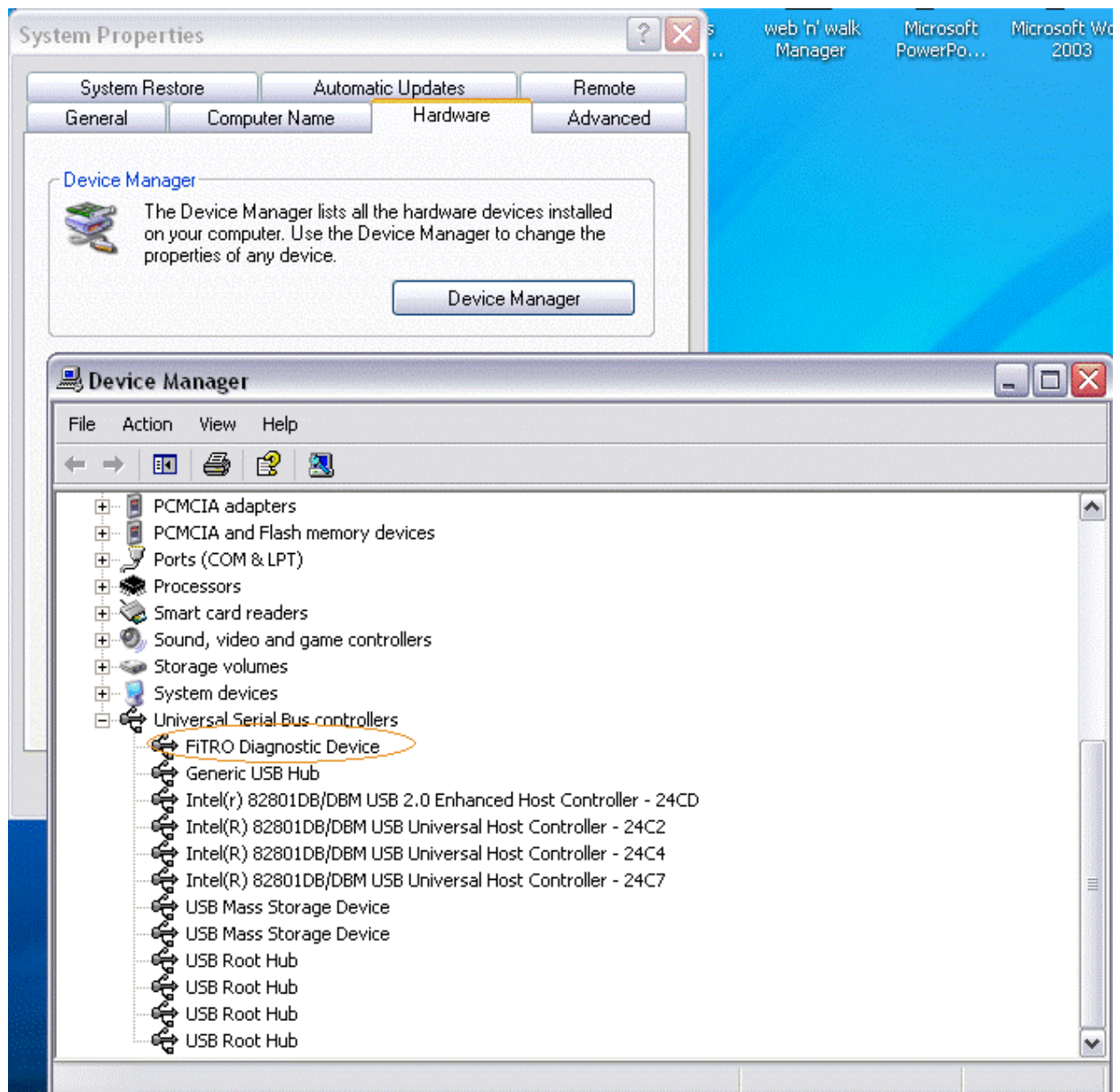
RUNNING THE PROGRAM

Program main menu with following options appears at the top of the screen: File, Subject, Diagnose, Exercise, Report, Setup, Help.

FILE

The program module offering the possibilities of saving and opening of data files from diagnostic and exercise measurement routines as well as configuration files (containing parameter assignment, ranges, step, etc. for measurement and report routines).

OPEN
SAVE
OPEN cfg
SAVE cfg
EXIT

SUBJECT INFORMATION

Input the information (optional), which will be stored with the data.

Special instructions for software version compatible with HDTS database system)

Obr.č.1

Input information as specified in the windows. Mandatory windows are <u>Given name, Family name</u> a <u>Birth Date.</u>

These data are used for the creation of directories for particular subject. An example in the dialogue box above directory Black_John_1958 will be created . Directory will be used for the storage of test data obtained on particular FiTRO diagnostic devices (e.g. AGILITY, JUMPER, PREMIUM). Data will automatically store into subdirectory of the currently used device you (in this case Premium). Additional subdirectory base on the current date in the form YYYY_MM_DD will also be automatically created. File will be store under the alphanumeric name specified by the user.

Should the subject be a part of database, one can look his/her subject´s info up in Search for subject and load it into the memory Pick up selected.

One can create the club subdirectories (Adding club into directory).

Click on OK brigs you to the Main Menu of the program.

DIAGNOSE

Click opens 3 options to choose from.

New test set
Continue with new subject
Continue with same subject

New test set

Use this option if you wish to start new test set with new subject.

At first, you can fill in "Subject Information" data. (see section SUBJECT INFORMATION in this manual).

As a next step you have to specify type of exercise, weight you are about to use in the initial repetition as well as the parameter to be displayed on line during measurement. Default scaling for this particular parameter appears automatically on the right side of the screen. However, you are free to modify maximal, minimal as well as scaling of on-line parameter selected.

In subsequent box you have set the range of motion for subsequent exercise. You may use a typical exercise movement "Set ROM", or input appropriate data via keyboard ("Input ROM data").

Set ROM (by means of exercise movement)

Confirming this selection a simple graph scheme for the estimation of range of motion appears on the screen.

The instruction at the top advises the test subject to take the starting position. Click on OK activates the system to record the range of motion. The test person should perform a single repetition of forthcoming exercise. Column in the middle of the screen simulates movement of the barbell or lever of exercise machine. The intelligent system recognizes automatically the direction of initial movement (either downward or upward), so that column starts to move in appropriate direction.

After return to the initial position a graph will be automatically adjusted so that optimal axis scaling appears on the screen. System is ready for the first repetition.

Input ROM data (via keyboard)

Selecting this option opens another dialogue box, in which range of motion (in cm) as well as the direction of the movement from starting position (upwards or downwards) should be specified.

On the vertical axis there will be position and on the horizontal axis the parameter to be displayed during measurement (The velocity has proved to be the most practical and hence the recommended parameter for on line monitoring of weight exercise test procedure.)

At the top of the graph the value of weight to be used (specified in previous dialogue box) is being displayed. Be sure the input value match the weight on the barbell or exercise machine!
At the right side of the screen there is a column with recorded range of the motion marked with filling. A short stick perpendicular to the column symbolizes the movement of the axis of barbell or lever of weight exercise machine.

The instruction at the top of the screen advises the test person to perform a repetition. Click OK to prepare the system for measurement.
While performing repetition, the movement of barbell axis as well as the instant values of parameter specified will be graphically displayed on the screen. The curves for eccentric and concentric phase will appear in different colors (yellow and cyan) on left and right half of the graph (plus or minus values) respectively.
After completing a repetition, the digital summaries for eccentric and concentric phase containing maximal and mean values of velocity, force, acceleration, power as well as work performed and duration will be displayed.

At the bottom of the screen there are options for the further control of the program.

F2 (CLOSE AND STORE) - allows you to close the diagnostic session and to store the data from all previous repetitions.
This option may be used after completing the whole diagnostic exercise set with stepwise increasing weights in subsequent repetitions.
However it appears safer to store data more often, preferably after each repetition.

Storing the data brings you back to box with 3 options (as shown above).

New test set (described in above section)
Continue with new subject
Continue with same subject

Continue with new subject

This option should be selected if we are about to continue with the subject already having his file containing previous repetition (or repetitions) on the disk.
Selecting this option activates dialogue box to open a file of particular subjects containing data sets from previous repetitions.
Loading a file brings you to routine, in which you have to modify weight (displayed at the top of the graph) for forthcoming repetition using cursor arrows. After clicking OK, the instruction "TAKE THE STARTING POSITION, OPERATOR PRESS ENTER!" appears on the screen and the system is ready for next repetition (see description above).

Continue with the same subject

Selecting this option recalls the routine, in which modification of weight may be carried out. (OPEN file procedure is unnecessary since the system keeps the data from previous repetitions). Using cursor keys, adjust the value at the top of the screen to correspond with weight of the forthcoming repetition.

After pressing ENTER the instruction "TAKE THE STARTING POSITION, OPERATOR CLICK OK!" appears on the screen and the system is ready for next repetition (see description above).

May it happen that repetition was carried out in an incorrect way, e.g. because of insufficient concentration or the test person failed to complete it because of too high weight, press F6 (IGNORE). Subsequently, you may either repeat repetition (REPEAT) or to store whole set of so far performed repetitions (STORE).

EXERCISE

This option allows the feedback monitoring of biomechanical parameter during weight exercise.

At first, you have to input type of exercise and actual 1RM. This maximal value will be used as the basic information for the calculation of weights recommended for strength training with various goals.

These can be specified in the next window. There are 4 type of training to be chosen from:

   * Maximal strength
   * Explosive strength
   * Bulk (muscle hypertrophy)
   * Strength endurance

After specifying the training goal, recommended weights (in kg or expressed as % of maximum) for the forthcoming exercise appear in the next two right windows. However, both values can be modified. Since they are software-tied, change of one automatically modifies also the other one.

In the window located in the middle of right side of the screen you can specify (using cursor keys) whether you wish the peak or mean values of power to be displayed during exercise.

In the next window you have to specify, what sort of power maximum should the system use to calculate critical level (expressed in % of maximum) of power, i.e. the level the power in repetitions during the set should not decrease below.

After inputting all the requested parameters and clicking OK, 2 graphs appear on the screen.

The upper one is ready to show either mean or maximal value of parameter specified after each repetition performed in a set.

At the top weight of the barbell in kg as well as the critical value in percent of maximal power will be displayed. Critical value of power can be modified using cursor keys.

If you have already set (in previous dialogue box) a maximal value of power, the corresponding critical line (in percent) will be displayed prior to test.

If you decided to use a maximum as the peak value from initial repetitions in a set, this line will be displayed after first repetitions. However, it may be corrected during the set, if some of repetitions exceed the values of the first one

The lower chart is the same as the one in diagnostic routine.

On the vertical axis there will be position and on the horizontal axis the parameter to be displayed during measurement (The velocity has proved to be the most practical and hence the recommended parameter for on line monitoring of weight exercise test procedure.)

At the top of the graph the value of weight to be used (specified in previous dialogue box) is being displayed. Be sure the input value match the weight on the barbell or exercise machine!

At the right side of the screen there is a column with recorded range of the motion marked with filling. A short stick perpendicular to the column symbolizes the movement of the axis of barbell or lever of weight exercise machine.

Prior to exercise you have to check whether the position of symbolic barbell axis on the screen is in agreement with position of real barbell axis in the starting position of forthcoming exercise. If not, change the position on the screen clicking on appropriate button.

After clicking OK the system is ready to monitor the forthcoming set.

After each repetition the value of power (peak or average - according the previous specification) will be displayed in a form of bars. Beep tone will indicate the lowest and highest position while performing repetitions. If the power output in particular repetition does not exceed the critical value, a long beep tone comes as a warning.

REPORT

Graph and digital reporting routines are available.
Graph reporting includes
      Single repetition graph
      Diagnostic set graph
      Training set graph

SINGLE REPETITION GRAPH

Graph shows the data from single repetition.
To assign the parameters and specify minima, maxima and scaling of X, Y1 and Y2 axes, and select desired repetition use the section in lower part of the window.

At the right side of the screen there are summary tables containing maximal and mean values of force F (N), velocity v (cm/s) and power P (W), acceleration a (m/s), work performed A (J) separately for eccentric and concentric phase, as well as their duration in ms.

To move screen cursors along X axis click on the arrow bands under the chart. You can also specify the X-axis position by clicking directly on the curves.

While moving the cursors, corresponding digital data are being displayed at the top of the screen (left side for left and right side for right cursor). In addition to actual X, Y1 and Y2 values for corresponding cursor position, also difference between both cursor on X axis and related integral and mean values of Y1 and Y2 parameters are being actualized.

Click on the zoom button extends chart segment between cursor to the whole width of the chart area.

Click on the print button if you wish chart to be printed.

Click on the OK button closes the window and keeps the current setup of the chart (parameters assignment, maxima, minima, scaling, ...)

Closing with Cancel (or click on the cross in right upper corner of the window) closes the window without keeping any set up modification performed.

DIAGNOSTIC SET GRAPH

The option displays the relationship between maximal or mean values of specified parameters (separately for eccentric or concentric phase) obtained from repetitions with different weights.

You have to specify the graph options in the area at the bottom of the screen, i.e. to assign parameters as well as minima, maxima and scaling for X, Y1 and Y2 axes. You have also to select what kind of values (peak or mean) from what phase (eccentric, entire concentric or acceleration concentric) and what repetition with particular weight (best, average of all performed or all) should be used for the graph.

Click on the print button if you wish chart to be printed.

Click on the OK button closes the window and keeps the current setup of the chart (parameters assignment, maxima, minima, scaling, ...)

Closing with Cancel (or click on the cross in right upper corner of the window) closes the window without keeping any set up modification performed

DIGITAL

In digital form either summary data from several repetition or time data from single repetition can be displayed.

Summary

Routine displays a summary data from particular repetitions in a set performed.

You can select what kind of values (peak or mean) from what phase (eccentric, entire concentric or acceleration concentric) should be displayed.

Click on Copy or Copy All copies highlighted line or all lines to the clipboard.

Click on the print button if you wish chart to be printed.

Click on the OK button closes the window.

Attempt

This program module enables to display digital data sampled at the rate of 100 Hz from particular repetition or from exercise set.

Click on Copy or Copy All copies highlighted line or all lines to the clipboard.

Click on the print button if you wish chart to be printed.

Click on the OK button closes the window.

CONFIGURATION

Option allows you to specify serial port (COM1 or COM2) used for the communication between the interface and computer. Be sure to make selection corresponding with actual connection. Mismatch will cause malfunction of the system!

Inclination angle (preset at zero for vertical movement) should be specified if exercise machine with weights moving in inclined direction is used. Degree deviation from vertical direction should be filled in.

CALIBRATION

For safety reasons access to this routine is not offered in main menu. However, it can be activated by pressing CTRL-F8.

Routine starts with message "Calibration is to follow. Back with ESC". After confirming the selection (by pressing ENTER) you are required to input the calibration distance (between 10 to 100 cm). In order to achieve the highest possible calibration accuracy, use the highest distance (up to 100 cm) particular exercise mode or machine allows.

After input (distance XY) and confirming by ENTER the instruction follow: "Pull exactly XY cm and press ENTER." Performing the pull and pressing ENTER brings next message "Return to starting position and press ENTER". After executing and pressing ENTER, another instruction appears on the screen: "Pull at least XY cm." Performing the pull with moderate to fast velocity brings automatically the message: "Calibration done. Press ENTER to continue!"

After pressing ENTER, the calibration constants will be saved in configuration file. The calibration data of this file will be loaded after starting of the program used to correct the distance and velocity data recorded from sensors.

Prior to shipping, the systems are properly calibrated. However, calibration will be necessary, if you are going to use weight exercise machine, in which - due to levering - there is different velocity of point of force application and weight itself (the system is coupled with by means of kevlar tether).

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