Newtest PowertimerPC

User Manual
Version 1.0

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1 PowertimerPC

1.1 Introduction

This document is a user manual for Newtest PowertimerPC software.

Powertimer is a measurement system used to test athletic performance with some twenty different athletic performance tests relating to their speed and power. It is modular, completely portable and includes a jump mat and several photocell gates.

PowertimerPC is the software that controls Powertimer's functions and tests, and calculates and displays the test results. Powertimer cannot be used without the program. PowertimerPC also replaces an earlier program and application used to manage the testing, the Palm Powertimer, which was run on a Palm PDA. Now that the measurements can be completed via a personal computer, the user interface has been improved dramatically, and also some new functions have been added to the program – most importantly, testing can also be done without previously set up group, subject and session data.

Powertimer Analyzer is an additional software product used to read and analyze the results acquired with the PowertimerPC. Measurements made with the PowertimerPC can be transferred to the Analyzer, where the subject's performance can be analyzed more efficiently. Powertimer Analyzer is currently a separate program, and must also be installed separately. See chapter "Using Analyzer" to find out about communication with Analyzer.

Software updates are available at http://www.newtest.com/faq.asp.

1.2 System requirements

PowertimerPC requires;

- A personal computer with
  - Windows 2000 or later as its operating system
  - Free USB or serial port
  - CD drive
  - 6 Mb of free space from your hard drive
  - Microsoft .NET Framework 1.1 installed (it is also included on the same CD with PowertimerPC)
- A Powertimer measurement hardware with a serial port

It is recommended that you run PowertimerPC from a laptop when doing measurements. The Powertimer testing system is designed to run from its own power source (rechargeable batteries), therefore, **unplug both the PC and the Powertimer from the mains before you start testing. Make sure that you have the system recharged prior to next testing session to make sure that you will have full power supply.**

1.3 Using PowertimerPC

1.3.1 Installation

Installing PowertimerPC to your hard drive:

1. Put the Powertimer software disc into your CD drive.
2. Find and launch a program called "Setup.exe" or "Setup" from the CD drive in My Computer. This will launch the installation program.
3. If the installation is interrupted early on by an error or a warning message claiming that you don't have Microsoft .NET Framework 1.1 Service Pack 1 (or similar) installed, close the installation. You

need to install .NET Framework first. You can find it in the same CD, under a folder called "NET Framework". Try running "dotnetfx.exe" or "dotnetfx" to install the framework. The folder also contains an upgrade file, which you can use if you had an earlier version of the Framework installed. After this, reboot and run the PowertimerPC installation again.

4. Go through the installation program. After PowertimerPC has been installed, it will also install current Microsoft Data Access Components (included in the installation file) to your computer. Don't interrupt this process, or the program won't launch!
5. Finally, if you are using your computer's USB port to connect to the Powertimer (see chapter "Connecting Powertimer to your PC"), you need to install a driver for the USB-to-Serial adapter included in the Powertimer suitcase. For Eminent USB-to-Serial Adapter the installation procedure is this:
    1. Plug the adapter's USB end to your computer. Windows will recognize the new device and prompt for device drivers.
    2. Insert the included driver CD to your computer and let Windows search for the driver.
    3. The installation procedure is fully automated. When the installation dialog closes, the adapter should be fully functional.
6. After this, PowertimerPC should be fully functional.

1.3.2 Connecting Powertimer to your PC

Powertimer's serial port and PC may be connected in two different ways:

1. Via a serial-to-USB adapter cable (included with Powertimer). Plug the serial (bigger) end of the cable to Powertimer and the USB (smaller) end to your PC's USB slot.
2. Via an ordinary serial cable, if your computer has a serial port. Some new computers and most laptops lack this feature.

Make sure that Powertimer and PC are properly connected before starting any measurements. You may use the Connection Tester to test that everything is in order.

1.3.3 User Interface

PowertimerPC's user interface is relatively simple and should be usable even without reading these instructions.

Main UI

This is the main UI. From up to down, it contains first the menu with all its useful functions, then the tool bar buttons that are used for the actual functionalities of the program, and lastly the program space, where different components will appear. The program is closed by clicking "File" and under it, "Exit". Only one of

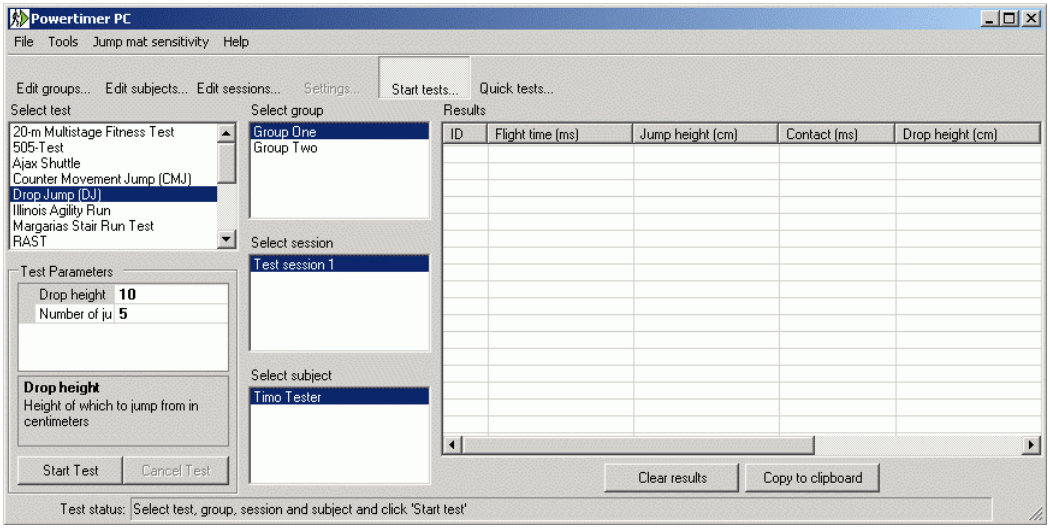
the toolbar functions can be open at a time - when you are editing your test subjects, you cannot at the same time complete quick tests or create groups. Clicking another function **will close everything you were doing**, which may at worst stop your test session suddenly.

More information about editing groups, subjects and sessions can be found from chapter "Management". Information about testing is found from the next chapter, "Testing".

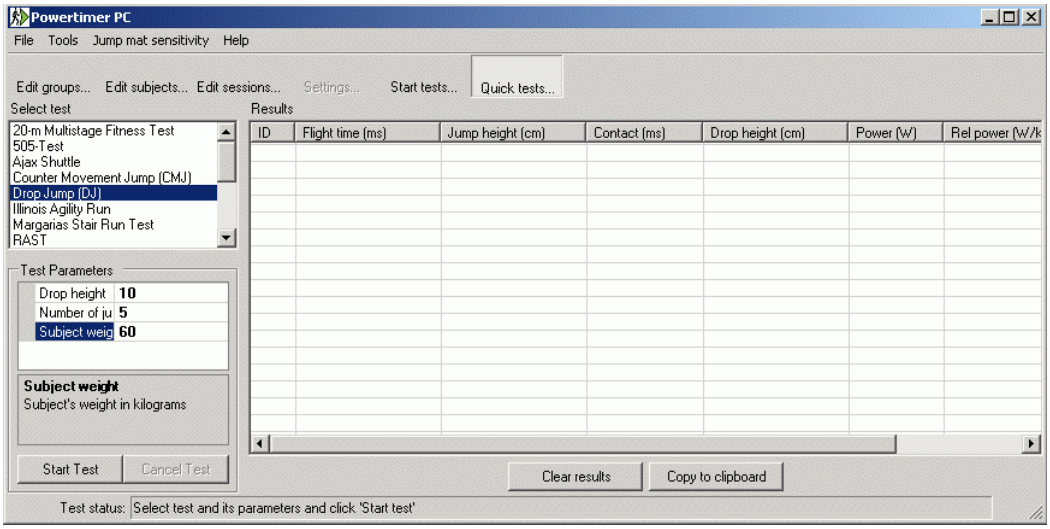
1.3.4 Testing

PowertimerPC allows the user to do tests in two different modes.

- **Normal mode** is started by clicking "Start tests" in the program. It functions similarly to the Palm Powertimer - to do tests, you need to have a group, a subject and a test session already set up (see chapter "Management"). The results are saved and can be exported to Powertimer Analyzer, a program that can analyze the measurements and show and print reports from them (see chapter "Using Analyzer").
- **Quick mode** is started by clicking "Quick tests" in the program. These tests don't require any setting up - however, no results are saved. Make sure to copy them to your own notes before closing the program, changing the test, or clearing the screen, because after they have been lost they cannot be retrieved in any way!



Normal testing mode



Quick testing mode

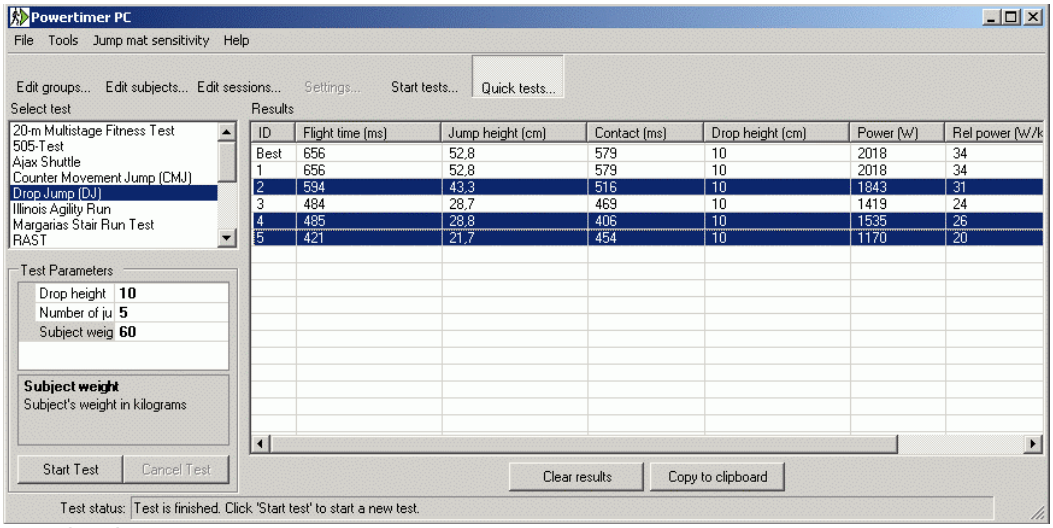
The two images above display the test screens for both normal and quick tests. As can be seen, these two differ in two different ways;

- When doing quick tests, you don't have to select a group, subject or a session
- In quick mode, the testing is done anonymously. If the test would require a subject-dependent parameter, you need to input it manually - for example, "subject weight" in the picture above.

Setting up a test is done in five phases:

1. Select the test you want to complete.
2. Select the group whose subjects will do the tests. If no groups are available, you must create one by clicking “Edit groups…” in the toolbar. *(This is not required for Quick tests)*
3. Select the subject which will do the tests. If no subjects are available, you must create them from “Edit subjects” part of the program and assign them to a group (see chapter “Subject management”). *(This is not required for quick tests)*
4. Select the test session. If no sessions are available, you must create one from “Edit sessions” part of the program. The session must be set up for the group you wish to make tests with. *(This is not required for quick tests)*
5. Set up test parameters. The parameters box is on the lower left part of the program. Click the different parameter names (e.g. “Drop height” or “Subject weight”) to see their descriptions and fill their values to the cells on their right side.

After the test has been chosen, possibly group, subject, and session chosen and test parameters set up, clicking "Start Test" will start the testing. At the bottom of the screen is a "Test status" bar, which will display helpful information about the test's status and what is expected of the tester and the subject next.



Results view

After testing has been completed, the window will be similar to the one shown above. Some results have been highlighted; this is done manually by clicking them. Several results can be chosen by clicking with shift or control pressed on your keyboard. The highlighted results can be copied to your clipboard by clicking "Copy to clipboard"; afterwards, they can be pasted to any program. For example, pasting these results to Microsoft Excel would accomplish this:

	A	B	C	D	E	F	G	H
1	2	594	43,3	516	10	1843	31	0,08
2	4	485	28,8	406	10	1535	26	0,07
3	5	421	21,7	454	10	1170	20	0,05

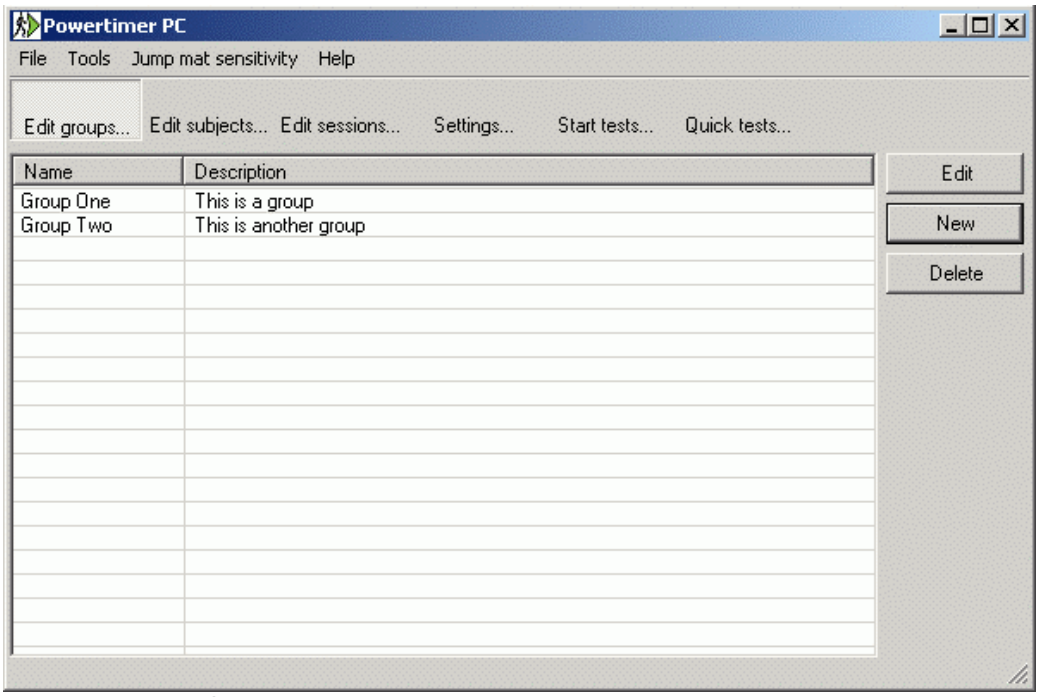
Excel (spreadsheet) data

Information about specific tests can be found from the chapter called "Test Descriptions".

1.3.5 Management

When you are creating new groups, subjects and sessions, you should start the process by creating the groups. To be able to do any measuring (excluding Quick tests), you need to have at least one group set up with at least one subject and one session related to it.

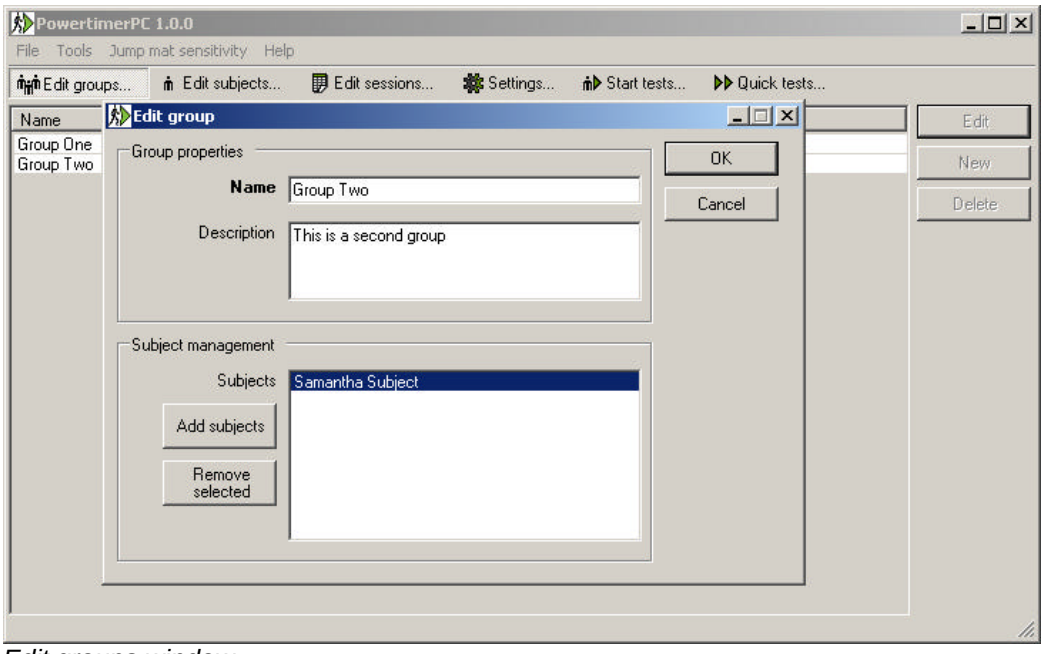
1.3.5.1 Managing Groups



Manage groups view

Selecting a group (thus highlighting it) and clicking "Delete" will remove the group completely. Nothing will be left; also, all sessions related to the group will be deleted, and therefore also all the results related to the session. Therefore, removing groups is not advisable if any measurements have been done with them.

Clicking "New" or "Edit" (with a group selected) will open the group edit dialog.



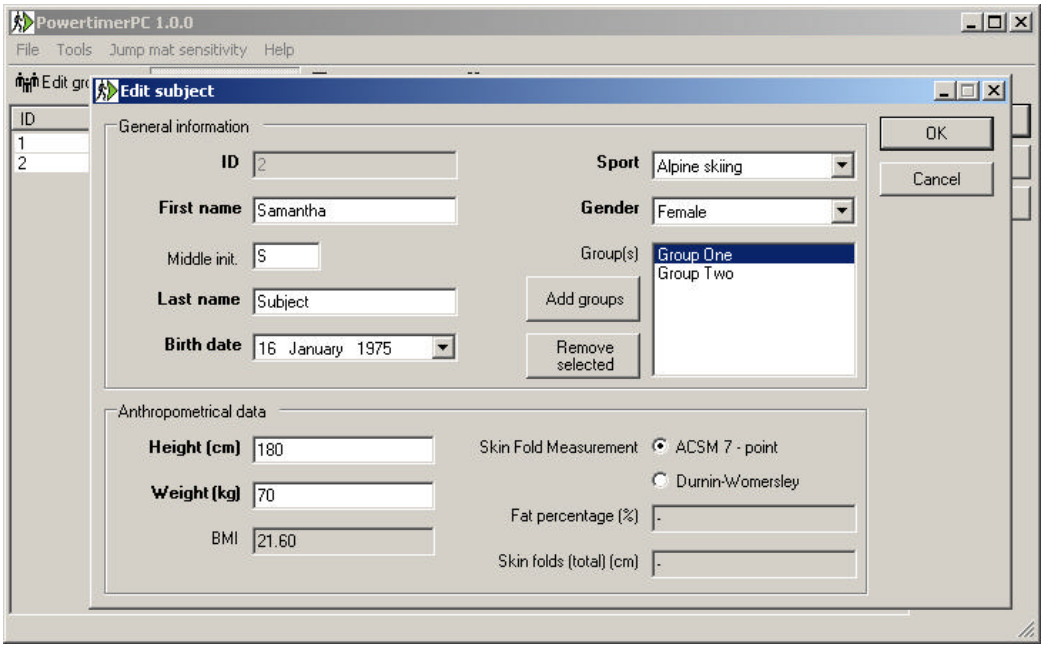
Edit groups window

Fill in or edit the group's information in this window. Every group must have a name; writing a description is optional, but recommended.

If you have already created some subjects, clicking "Add subjects" will allow you to add them to the group, and selecting subjects and clicking "Remove selected" will remove them from the group. Any number of subjects may be added to one group, and a subject may belong to any number of groups.

1.3.5.2 Managing Subjects

Subject management functions exactly the same way as group management. The main difference is the amount of data available.

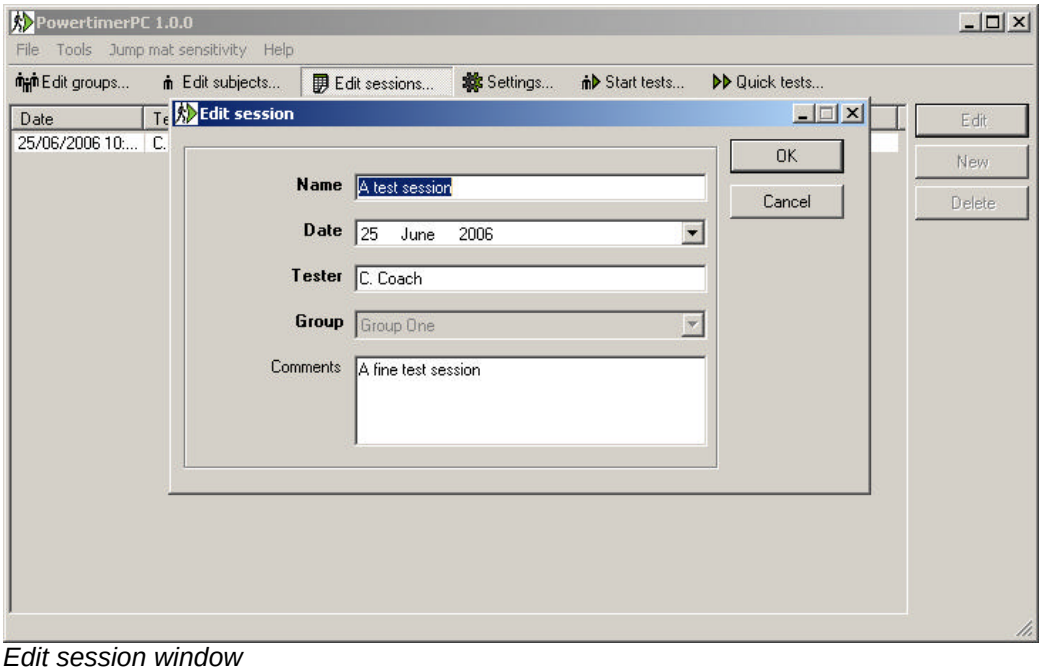


Edit subject window

All fields in bold must be filled for a new subject, or the program won't accept him/her. "ID" is an identification string, which needs to be unique. It can, however, be otherwise chosen freely - it can be e.g. the person's Social Security Number. The program automatically chooses the lowest available numeric ID as the default ID.

When both weight and height have been specified, Body Mass Index is calculated automatically. If the subject has completed Skin Fold Measurement earlier, also its results are visible. Groups can be added and/or removed with their respective buttons.

1.3.5.3 Managing Sessions



Edit session window

All fields in bold must be filled before a new session can be created.

An important detail in relation to group and user management is the fact that once a session is created, it is permanently related to its chosen group – the group setting cannot be modified later on. When a session is edited, group selection box will be disabled as in the picture above.

Deleting sessions will also remove all results related to it, so deleting already completed sessions is not advisable.

1.4 Using Analyzer

Analyzer, Newtest's analyzing program for Powertimer data, can be used in cooperation with PowertimerPC. Choosing either "Import from Analyzer" or "Export to Analyzer" from PowertimerPC's menu and selecting Analyzer's database file (called "Powertimer_db.mdb") in its home folder will exchange information between PowertimerPC and Analyzer. The information transmitted includes;

- **Import from Analyzer:** All subjects, groups and sessions from Analyzer are brought to PowertimerPC and added to its memory. New subjects will be given new numeric ID's automatically.
- **Export to Analyzer:** All subjects, groups and sessions are sent to Analyzer. Also, all new test results will be updated to Analyzer.

If a subject, group, session or test result has been already once transmitted from Analyzer to PowertimerPC or the other way around, it will simply be updated by this process. However, if you have created the same group, subject or session independently to both programs, it isn't possible to exchange their information. It is recommended that you use either PowertimerPC or Analyzer to create groups, subjects and sessions, and transfer them to the other program with these import/export features.

2 Testing

Additional information on the testing, Powertimer related tests and test result applications is available in the book "***Testing in Team and Power Sport***" (ISBN 952-99301-0-0) Published by Newtest Ltd.

2.1 Before Testing: Checklist

- Connect your laptop and the Powertimer hardware either via the Serial-to-USB adapted cable or an ordinary serial cable.
- If you aren't using the Quick mode, make sure that all required groups, subjects and sessions are complete; they cannot be edited while testing.
- Disconnect both your laptop and Powertimer hardware from the mains. If they are connected, interference from the electrical network may affect your test results severely.
- Set up the jump mat and light ports per instructions in the chapter "Test Descriptions".

2.2 Test Descriptions

Test parameters marked in *cursive* denote that they only need to be input when doing tests in Quick mode. In normal mode, this data is automatically used from the selected subject's profile.

2.2.1 20-meter Multistage Fitness

Setup:

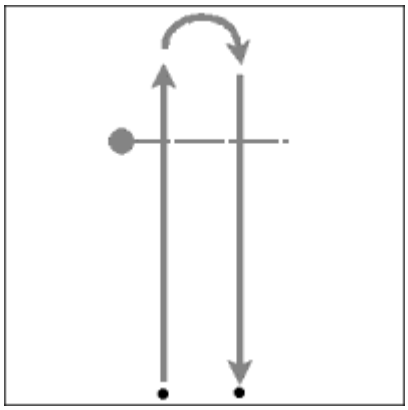
- Set up two light ports - one as the start, the second one as the stop point. Their distance from each other must be 20 meters.
- The subject will stand behind the start light port, facing the stop light port.

After the test is started (this is denoted by a toner sound), the tester should instantly start running through the start light port and towards the stop. He/she should keep a speed of at least the speed denoted as "initial velocity" in test parameters. After the subject has run through the other light, he/she will stop and wait for another toner signal - and after this, run back at the start point. This will be repeated with gradually shortening time spans until the subject has failed to get to the other point before the toner signal a predetermined number of times.

Parameters:

- Errors allowed: how many times the subject may fail to arrive to the light port before the toner sound - after this many errors are received, test ends
- Initial velocity: initial target velocity in kilometres per hour or miles per hour
- Velocity increase: increase of the target velocity per minute in kilometres per hour or miles per hour
- *Subject age: age of the subject in years*

2.2.2 505-test



505 test course

Setup:

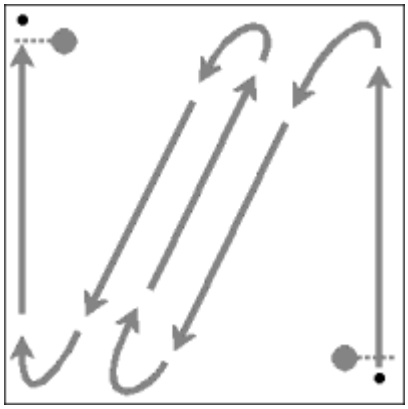
- Choose the start point for the test and mark it for the subject. The subject will stand behind this point until the test is started.
- Set up one or several light ports 10 meters from the starting point. They may be connected to any light port connections in the Powertimer suitcase.
- Mark a turning point 5 meters from the light ports so that the turning point is 15 meters from the start point.

When the test is started, the subject will run from the start point through one of the light ports, turn at the turning point and run back through the light port and to the starting point. The test will be repeated a predetermined number of times for both legs - first turning in one direction for an amount of times, afterwards, to the other direction. This enables the program to evaluate the subject's ability to change direction with both sides of his/her body.

Parameters:

- Number of retries: How many sprints are performed per leg
- Start direction: Which leg the subject uses for turning first

2.2.3 Ajax Shuttle



Ajax shuttle test course

Setup:

- Mark a 10 meters x 10 meters square as the testing area. Mark two opposing corners as the start and stop points.
- Place a light port near both points and connect one as the start point and the second as the stop point.
- The subject will stand behind the start light port near the start point.

When the test is started, the subject will run through the start light port, run through the track (to the other side of the test square and back two times) and afterwards, run through the last light port to stop the test.

Parameters: none

2.2.4 Counter Movement Jump (CMJ)

Setup:

- Connect the jump mat to Powertimer
- Let the subject stand on the jump mat

Counter Movement Jump is an extension of Static Jump. Now the jumps will be done with a counter movement - the subject will first bend down and then jump upwards. After the test is started, the subject should jump a predetermined amount of jumps. A long toner sound will confirm the ending of the test. If the subject has completed Static Jump before doing CMJ, he will also receive an elasticity index by completing this test.

Parameters:

- Number of jumps: how many jumps will be completed
- *Subject weight: weight of the subject in kilograms or pounds*

2.2.5 Drop Jump (DJ)

Setup:

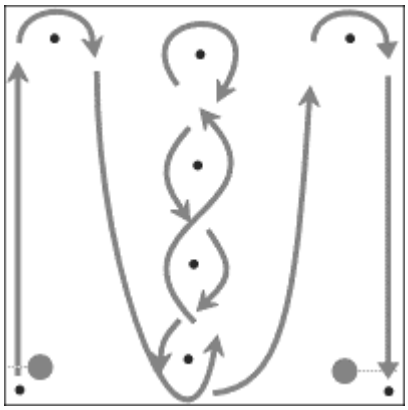
- Connect the jump mat to Powertimer
- Place a solid object next to the jump mat. The subject will rise to stand on top of it.

Drop jumps are jumps that are started off the mat, from a height - the subject will jump down to the mat and instantly jump again, finally landing back on the mat. After the jump has been completed, he/she will again rise to the height and complete another jump, until the predetermined amount of jumps has been done.

Parameters:

- Drop height: height of the drop in centimetres or inches
- Number of jumps: how many jumps will be completed
- *Subject weight: weight of the subject in kilograms or pounds*

2.2.6 Illinois Agility Run



Illinois Agility Run test course

Setup:

- Set up the testing arena. This will consist of a track 10 meters long and 2.4 meters wide. Place markers in the positions shown by the image.
- Place a light port near both the start and the end points.
- The subject will stand behind the start light port near the start point.

When the test is started, the subject will run through the start light port, run through the track and afterwards, run through the last light port to stop the test.

Parameters: none

2.2.7 Margaria Stair Run

Setup:

- Place one light port (start) on the bottom of a staircase and another (stop) upwards. Measure the vertical height difference between the light ports.
- The subject will stand on bottom of the staircase, behind the first light port.

When the test is started, the subject will run from the bottom of the stairs through both light ports.

Parameters:

- *Subject weight: weight of the subject in kilograms or pounds*
- Vertical rise: vertical height difference of the light ports in centimetres or inches

2.2.8 RAST

Setup:

- Set up a course where two light ports (start and stop) are set up with a 35-meter distance from each other.
- The subject will stand behind the first light port.

In Running Based Anaerobic Sprint Test the subject will have to run six 35-meter sprints with 10 seconds to rest between them. The subject should start running immediately after he/she hears the Powertimer's toner - after arriving at the end of the course, he/she will have a 10 second break to rest, and then another toner sound will be sound. After this, the subject must run back to the first light port. The pause will be repeated, and then another sprint will be done.

Parameters:

- *Subject weight: weight of the subject in kilograms or pounds*

2.2.9 Reactivity-Stiffness Test

Setup:

- Connect the jump mat to Powertimer
- Let the subject stand on the jump mat

Reactivity/stiffness test is executed in exactly the same way as a Static Jump. The subject should try to keep his/her contact times on the mat as small as possible.

Parameters:

- Number of jumps: how many jumps will be completed

- *Subject weight: weight of the subject in kilograms or pounds*

2.2.10 Repetitive Jump Test

Setup:

- Connect the jump mat to Powertimer
- Let the subject stand on the jump mat

Repetitive jump test is a jump test, where the test subject has to jump continuously on the jump mat for 60 seconds, or complete a predetermined amount of jumps. Start the jumps after the sound signal and continue them until you hear a long sound signal.

Parameters:

- *Subject weight: weight of the subject in kilograms or pounds*
- Test ends after: whether to end the test after 60 seconds of jumping or after a predetermined amount of jumps has been completed
- Number of jumps: if you selected to end the test after a number of jumps, input the number here

2.2.11 Skin Fold Measurement

Setup:

- None required

No actual measuring will be done with Powertimer in this test. Input the required skin folds to the test's parameter box and click "Start test", and the program will calculate the subject's fat percentage.
Parameters:

- Several different body parts: Measure skin folds from all these locations from the subject's skin and input them to the parameters in centimetres or inches.
- *Subject age: The age of the subject*

2.2.12 Speed Test

Setup:

- Place any number of light ports with constant distances from each other. Whether they are connected to Powertimer's start, lap or stop connection doesn't matter.
- The subject will stand behind one of the light ports.

Speed test is a simple way to do speed testing. After the test has been started, the subject must run through the light ports set up. The course will continue until a predetermined number of sprints have been recorded.

Parameters:

- Sprint distance: the distance between light ports in centimetres or inches
- Number of sprints: how many sprints between light ports the test should consist of

2.2.13 Static Jump (SJ)

Setup:

- Connect the jump mat to Powertimer
- Let the subject stand on the jump mat

Static Jump is the basic jump test. Let the subject jump a predetermined amount of jumps on the jump mat. A long toner sound will confirm the ending of the test.

Parameters:

- Number of jumps: how many jumps will be completed
- *Subject weight: weight of the subject in kilograms or pounds*

2.2.14 Static Jump with Weights

Setup:

- Connect the jump mat to Powertimer
- Let the subject stand on the jump mat, with weights on him/her

This test is completed the same way as Static Jump, but this time with additional weights. If Static Jump has been completed beforehand, PowertimerPC will be able to calculate an explosive strength index for the tester.

Parameters:

- Extra load: Weight of the extra weights in kilograms or pounds
- Number of jumps: how many jumps will be completed
- *Subject weight: weight of the subject in kilograms or pounds*

2.2.15 Take-off Reaction Test

Setup:

- Place the jump mat in front of the Powertimer, and place a light port 5 meters to the Powertimer's left and right side (whether the ports connect to start, stop or lap isn't important).
- The subject will stand on top of the jump mat, facing the Powertimer suitcase.

5-10 seconds after "Start test" is pushed, Powertimer flashes either its right or left direction light. The subject should instantly accelerate to the direction the light points and run until he/she arrives at a light port. After this, the subject should return to stand on the jump mat. Another light will be flashed 5-10 seconds after the subject has arrived at the mat. The test will be repeated several times to both directions - each time the direction to sprint to will be randomized.

Parameters:

- Min sprints per direction: minimum number of sprints to do per direction (e.g. if "3" would be selected, the test would consist of at least 3 sprints to left and 3 sprints to right)
- Max sprints per direction: maximum number of sprints to do per direction

2.2.16 Throwing Gate

Setup:

- Hang the jump mat (note that you can replace the jump mat with a set of photocells) to a stand vertically, so that the subject can easily hit it by throwing a ball
- Place several light ports on top of each other a predetermined distance away from the jump mat. They should be placed so that the ball will go through at least one of the light ports before hitting the jump mat.
- Give the subject a ball and let him/her stand somewhere behind the light ports.

In this test the subject throws a ball through a light port and hits the jump mat (which is hanging on a wall) with it. After the hit, throw the ball again and again as many times as selected by the parameter.

Parameters:

- Ball mass: Mass of the thrown ball in kilograms or pounds
- Number of throws: How many times to throw the ball
- Throw distance: How far the light ports are from the jump mat in centimetres or inches

2.2.17 T-Test

Setup:

- Place the jump mat in front of Powertimer and connect it.
- Place two light ports on the sides of Powertimer (a predetermined distance away from the jump mat). The light ports should connect to a connector labelled either "lap" or "stop".
- Place another light port in front of the Powertimer (a predetermined distance away from the jump mat). This light port should connect to the connector labelled "start".
- The subject will stand behind the "start" light port

T-test is another reaction test similar to Take-off Reaction Test. This time, however, a third light port is set up in front of the jump mat and the test subject starts sprinting behind it. After "Start test" is clicked, the subject may start sprinting whenever he/she wants. When the subject lands on the jump mat, a light is displayed, and the subject must run to the direction it pointed until he/she arrives at another light port.

Parameters:

- Approach distance: distance of the first light port from the jump mat in centimetres or inches
- Acceleration distance: distance of the two other light ports from the jump mat in centimetres or inches
- Min sprints per direction: minimum number of sprints to do per direction (e.g. if "3" would be selected, the test would consist of at least 3 sprints to left and 3 sprints to right)
- Max sprints per direction: maximum number of sprints to do per direction

3 Troubleshooting

3.1 Common problems

1. **The installation program won't run.**

   It is likely that your computer doesn't have Microsoft's .NET Framework installed. This framework is required by many different modern programs and is recommended for all Windows users. You can install the framework either through Windows Update or by running a file called "dotnetfx.exe" from the Powertimer installation CD's folder called "NET Framework".

2. **Even though I installed the program, when I start it, it shows an error about Microsoft Data Access Components or MDAC and closes.**

   The install was probably completed unsuccessfully. It is important to also let the Data Access Components to install - this will be done automatically after PowertimerPC has been installed. You only need to accept Microsoft's license agreement for the components.

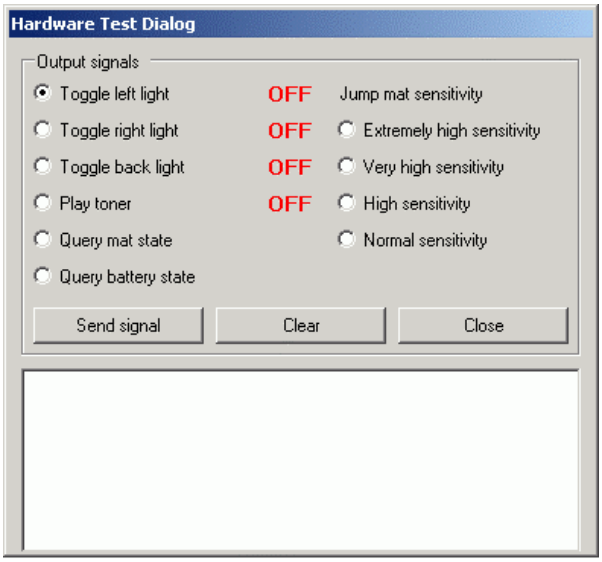
3. **I cannot connect to Powertimer.**

   First, check that Powertimer is properly connected to your computer (see chapter "Connecting Powertimer to your PC"). Check also that the Powertimer suitcase has enough power - if its battery is empty, it cannot respond to the program. Thirdly, you may try to restart PowertimerPC or your computer. It may be that some drivers need to be updated before the USB connection functions properly. If none of these solutions function, contact Newtest for technical support (see chapter "Support")

4. **When exporting or importing data from Analyzer, the program ends up with duplicate groups, subjects and sessions.**

   This is caused by creating the same group/subject/session to both the Analyzer and the PowertimerPC. You should only create them to one program and then import/export them to the other via PowertimerPC.

3.2 Connection Tester



Connection tester window

Connection Tester is a separate part of PowertimerPC that you can use to check that Powertimer and your computer work together. Connect the Powertimer suitcase to your computer before running it. You can open the Tester from PowertimerPC's menu when the program is running - select "Tools" and under it, "Test connection".

Whenever Powertimer sends information (e.g. if the jump mat is connected, or someone triggers a light port) to the PC, it will be shown on the white space on the lower part of the window. You can also send commands to Powertimer. Choose a command you want to complete and click "Send signal" to send it to Powertimer. In the left part of the "Output signals" area are the following direct commands:

- **Toggle left light** and **Toggle right light:** One of the two direction lights in the Powertimer suitcase is turned on for a short period of time.
- **Toggle back light:** The back light of Powertimer's connection panel is turned on. This can be used to illuminate the connection ports when doing tests in dark.
- **Play toner:** Powertimer outputs a loud buzzer sound.
- **Query mat state** and **Query battery state:** Powertimer responds with related information; whether or not jump mat is connected, and whether or not batteries require recharging.

On the right side of "Output signals" are four different jump mat sensitivity settings. The different settings will cause the mat to trigger to signals of different strengths - usually, the lowest sensitivity is recommended. You may test different settings by selecting them, clicking "Send signal" and afterwards jumping on the jump mat.

Additionally, the window has two other buttons. "Clear" will clear the white box from text, while "Close" will close the window.

3.3 Support

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