HandBook ERGOSPEED

Fig 0.1: Ergospeed

The **Ergospeed** is a very useful tool during training.

Allows for real-time information on the speed with which you perform certain exercises

The **Ergospeed** is composed of a capture card that interfaces with the computer through the USB port, and a specially developed software application.

It is compatible with operating systems Windows XP and Windows Vista.

Permette di avere informazioni in tempo reale sull'esercizio che si sta svolgendo, grazie ad una applicazione software sviluppata appositamente.

Offers the possibility to save the data acquired during an exercise and then examine, study and possibly revise the data, at a later time.

The ability to customize any type of training, and to share this tool is made possible thanks to a convenient panel where you specify various parameters.

Ease of use is extreme, as well as its usefulness.

This tool was developed by engineer Francesco La Gala, for years engaged in the implementation of electronic interface with the computer to use during training in different disciplines. Collaboration with Robero Colli, allowed to work together to improve and develop different methods of training.

Several companies and sports teams currently use the easy convenient and versatile **Ergospeed**.

What does the Ergospeed?

The **Ergospeed** measure, and immediately lets you view on the computer monitor you are using (note the convenience where you have installed the software on a laptop), the speed in "mm / sec.

What is important to understand is that the **Ergospeed** needs a "pull" of a steel wire, which runs wrapped around a pulley (hard metal), which is attached to the actual measuring instrument. This system allows to transform the "pull information" of speed (expressed in mm / sec) and shift (expressed in "mm").

Each pull is composed of a concentric phase, in which the **Ergospeed**'s wire is pulled, and an eccentric phase, in which the **Ergospeed**'s wire is released. In both phases are measured velocities and shifts (displacements). The two phases together (concentric + eccentric) is therefore a repetition.

With the **Ergospeed**'s Software you can instantly display on the monitor and/or store on your PC in an excel file, other than information relating to concentric and eccentric phases (separately), such as:
- Duration expressed in "sec" (seconds)
- Moving expressed in "mm" (millimeters)
- Average speed expressed in "mm / sec"
- Maximum speed expressed in "mm / sec"
- Instant when you measured the maximum speed expressed in "sec"
- Distance measured the maximum speed expressed in "mm".

For each repetition, composed by the eccentric + concentric phase, is displayed on the PC monitor and/or saved on an Excel file:
- Sequential number of repetition, since the exercise is started up, until now;
- The time taken to perform the repetitions, expressed in "sec", that is, as expected, the sum of the duration of the concentric (pull), of the duration of the eccentric (release) and the waiting time between a repetition and the subsequent.

The **Ergospeed** can be used, for example, for an assessment of speed enforcement during concentric exercise in flat bench press.

Fig 0.2: Ergospeed on flat bench press

Other **Ergospeed**'s feature is to identify the value of resistant force, which evaluates the response of the athlete placed under tension for a given time. This exercise is performed on a flat bench press.

Further use of the **Ergospeed** is with the barbell on the shoulders of the athlete, that you can measure the speed of flexion...

Fig 0.3: Ergospeed with barbell, and PC in front of the athlete

The limits to the use of the **Ergospeed** are merely the fancy of the people using it. Take care to how the **Ergospeed** board is placed respect to the object for which you measure the speed: the wire will be stretched in a direction parallel to the direction in which the object connected is moving.

How you use the Ergospeed

We divide this section into two parts:
- Acquisition board, which concerns the hardware **Ergospeed**;
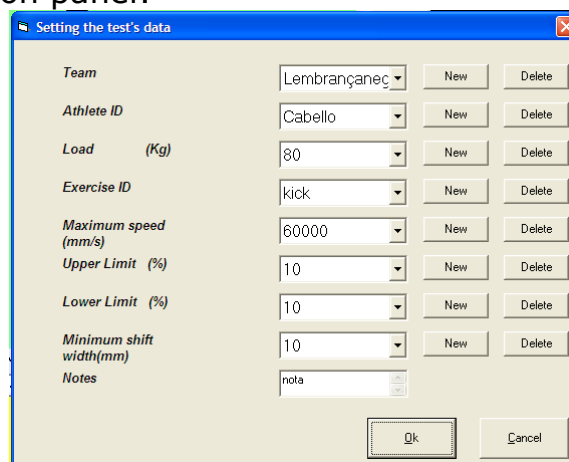- Software **Ergospeed**, which covers the program installed on your computer.

Acquisition Board Ergospeed

The Acquisition Board does not require special attentions, if not the following:
1- Plug it in your PC via USB Cable ;
2- Do not pull the thread of a length greater than 2 meters;
3- Set the Acquisition Board **Ergospeed** in an appropriate position with respect to the movement of the object to which it is attached (as described above). You can put it in other positions, but the measure would not be optimal;
4- Does not need additional power (batteries or power supplies) because it is powered from the USB cable connected to the computer.

Software Ergospeed

This is the configuration panel:

Fig 0.4: Configuration Parameters in software Ergospeed

By this panel it is possible to create:
1- a folder inside the computer, dedicated to the team that you're practicing;
2- un file all'interno della cartella della squadra, relativo all'atleta che effettua l'allenamento;
3- a file in the folder of the team, about the athlete who performs the training;
4- a value of maximum speed that you think should not be exceeded;
5- compared to this maximum speed, an upper and a lower limit, allowing signals when these limits are reached;
6- a minimum width of the extension of the wire, below which the repetition is not considered (see section "What does the Ergospeed?")
7- a field to enter notes (characteristics of the physical condition of the athlete, stress conditions, type of exercise explained in more detail ... etc. ...)

Created this panel (whose completion is not mandatory but only recommended to take a good track, in files that are saved on your PC, of the charachteristic mode in which it is carried out the exercise) you can start using the**Ergospeed**…

The following picture describes the functionality of the software in a concise way:
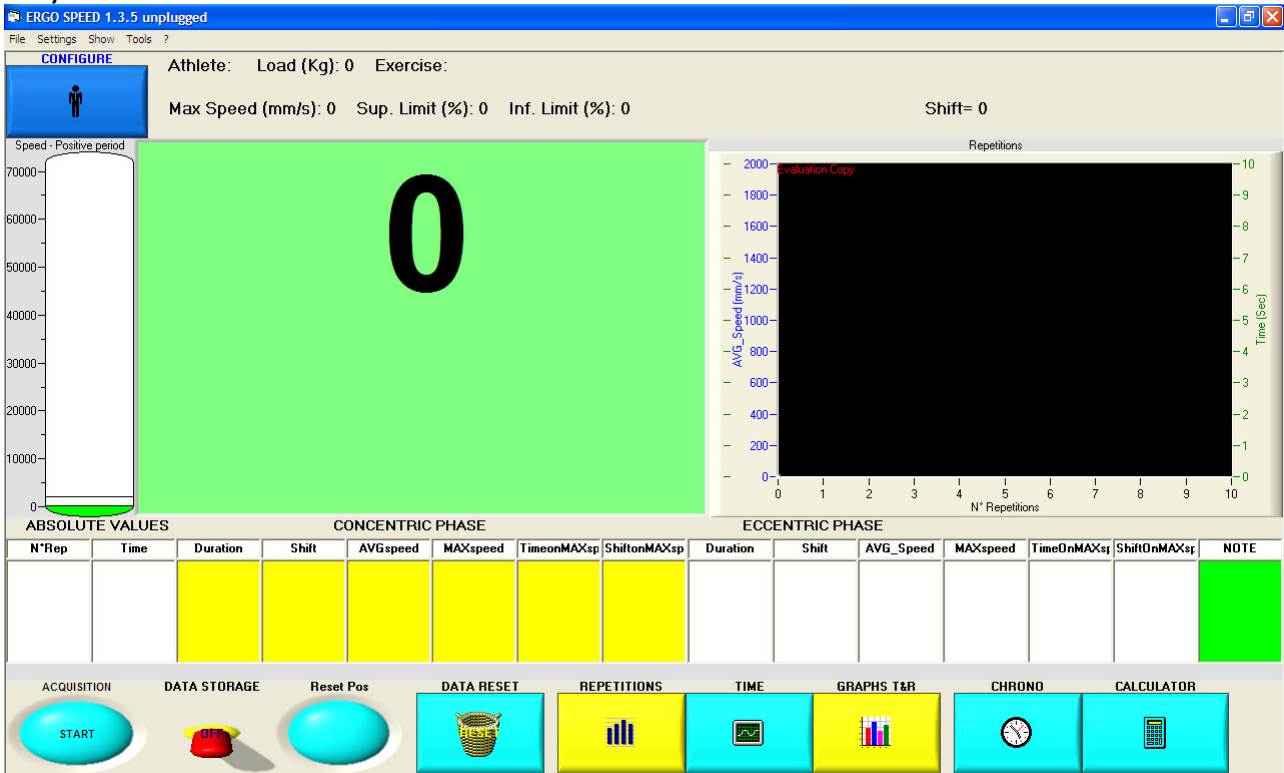

Fig 0.5: Main Panel software Ergospeed with speed visualization, shift and repetitions.

Starting from the top to the bottom:
The **blue button** with the little man, lets you open the configuration panel above described.

The **labels on the right side of the blue button** lets you view the configuration parameters inserted(Athlet, load, exercise…).

The **column** on the left, with speed values espresse in "mm/sec" indicare indicates the speed at wich you are polling the wire.

In the **big green recttangle**, the number in the mibble indicates the shifto f the object to which the wire is attached. The shift is related to the "zero position". (There is a proper button, for setting the zero position).

In the **right graph** it's visualized, <u>for each repetition</u>, the Average speed (blue) and the duration(green)

Now it's time to deal with the **rectangular shaped visualizers:**

- The first 2 are referred to the repetition (white); indicates the repetition number and the duration of the repetition;
- The Concentric phase (yellow); Indicates the average speed, the duration, the maximum speed, instant of maximum speed, shift on maximum speed.
- The Eccentrical phase (white); Indicates the same kind of information of the yellow buttons, but referred to the Eccentrical Phase.

In all these rectangular viewers, are showed in column the last 5 repetitions …

Finally, there are buttons in the row below:
- **START** lets you start viewing the values measured by the **Ergospeed**, once you start viewing, you can stop it by pressing again;
- **DATA STORAGE** allows you to save data in a file, which then can be opened with Excel; pressing it twice will turn off the storage;
- **RESET POS** allows you to set the zero or start position of the wire box Ergospeed when the exercise begins (actually, this reset can be done even when the exercise is started);
- **REPETITION, TIME e GRAPHS T&R** allows you to choose different visualizations:
  o with **Repetition** you will see speed and time of each repetition, with the full-screen graphics;
  o with **Time** you activate or deactivate viewing the chart with the shift and the speed versus time.
- **CHRONO** and **CALCULATOR** you can use 2 usefull tools: a chronometer and a calculator (default windows calculator).

Software Ergospeed Installation:

Download by the internet web page www.salvabyte.it the software, but only after receiving User Name and Password.

Info

Abuot informations refeer to the internet pages www.salvabyte.it
Or contact Simone Spanò: s.spano@spinitalia.com