S1846

Using the Pulse sensor

The instructions in this paper are designed to show:

- How to set up and use a Logbook Pulse sensor.
- How to set up some simple investigations using a Pulse sensor, Datadisc and a Logbook Datalogger.

Setting Up The Pulse Sensor

Before the using the Pulse sensor, it will be useful to familiarise yourself with the features which make this such a versatile sensor:

- ✓ This sensor is supplied with an ear clip, and - if purchased as accessories- a chest strap, and a sensor which collects data transmitted from the clip or the belt, and passes it to a Logbook Datalogger.
- ✓ With any attachment a red light will flash in the sensor case, at the top of sensor label, each time it detects a heart beat. Use this to ensure a pulse is being detected.
- ✓ When used remotely, if you want to record for longer than 17 minutes after starting the recording, you must press any button on the logger to keep the sensor functioning for a further 17 minutes, this can be repeated as many times as needed.

Using the Clip on the Finger

- ✓ Keep the hand steady during recording, as movement between the finger and the clip produces a false pulse event
- ✓ If there is difficulty getting a pulse from the finger, put the hand in warm water for 15 seconds to increase the blood flow to the skin, and try again after drying the hand.

Using the Clip on the Ear

- ✓ Then clip should be placed on the centre of the ear lobe. There are great variations between the lobes of different individuals, and this device is unsuited to some people.

Using the Chest Strap

- ✓ The best results are always produced by applying a small amount of the ECG gel to the two detection areas on the inside of the strap. These areas are the two horizontally stripped areas on either side of the body strap.
- ✓ The Pulse sensor must be kept within 1 meter of the body strap (0.5 m recommended) for the sensor to be able to detect the radio signal from the strap. Use of a shoulder bag, or similar, to hold the logbook, is recommended whilst recording remotely. The Pulse sensor a can be placed in a pocket or on a belt, with the logbook in the bag on the back. Any arrangement which allows the exerciser to move freely and at the same time keeps the Pulse sensor within 0.5 m of the strap will work fine.
- ✓ The strap has use a battery of the CR-20323 volt coin cell type. If no signal is obtained try changing this battery.

Investigating Heart rate recovery using the Chest Strap

1. Arrange the Pulse sensor as described above, and begin a recording on the logbook with the volunteer at rest for 30 seconds or more, to give a good contrast with the exercising data obtained during exercise which follows. The volunteer should vigorously exercise for at least a minute, and the rest for at least 2 minutes. Use a watch to record how long each phase of the process lasts, to allow easy correlation between activity and the data collected.
2. Heart rate recovery is widely accepted as a measure of fitness. The heart rate recovery is the fall in heart rate per minute in the period of 60 seconds following exercise.
3. The following set of data shows the results from resting, then running up and down stairs for 90 seconds, then resting again. The labels were attached by using the label function from the ‘graph→labels’ menu. Datadisc ‘help’ gives more details about using labels. In this case the heart rate recovery is 186 – 143 = 43.

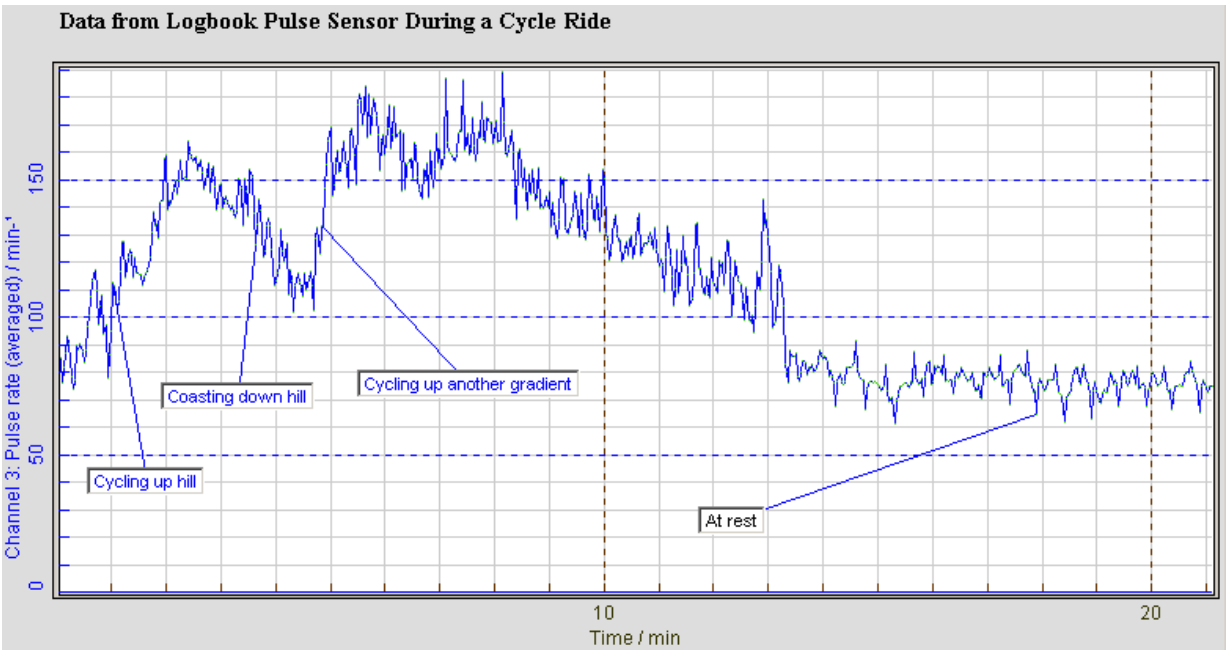
4. The spot cursor from the 'Graph→Cursor' menu, can be used to find the change in value between the end of exercise and 60 seconds later. Simply place the cursor on the first point and then left click hold down and drag to the next point, and release. The values of the change in the x and y axis and the gradient are all displayed above the graph.
5. These images have been scaled on the time axis and the y axis using the 'Graph→Scale' menu items

Investigating Heart rate recovery using the Finger Clip

Follow the procedure described above, and make 2 recordings of heart rate before and after exercise, as the clip must be static during recordings.

Investigating the effect of cycling on heart rate

With a Logbook ML, the Pulse sensor, in the front pouch of his cycling jacket, wearing a chest strap, our product tester cycled home and recorded his heart rate. It is possible to follow the



journey up and down a hill and a long flat section. These results show the excellent data which can be collected using the Pulse sensor.

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