

## Main Features

- Recording of physical activity by means of an accelerometer
- Recording of heart rate synchronously with activity
- Displaying time domain variability of the R-R Interbeat Interval (IBI)
- Frequency domain analysis of the IBI data
- Calculation of energy intensity during physical activity
- Derivation of individual HR-V02 relationship using built in Step Test or utilisation of externally derived calibration data
- Calculation of energy expenditure in daily living (validated against doubly labelled water)
- Data is stored in a database and is fully exportable for manipulation in third party programs

**The Actiheart** is the first truly lightweight (10gm) and waterproof self contained logging device which allows physical activity to be recorded synchronously with heart rate.

The Actiheart is worn on the chest. It consists of two electrodes connected by a short lead which simply clip onto two standard ECG pads. Being self contained, it is comfortable to wear for ambulatory activity and heart rate recording.

The Actiheart contains a battery which is recharged via a purpose built USB interface. Power can be taken from the PC or from an external power supply which is provided. This interface also allows data transfer to the PC for setting up the Actiheart and analysing the data using custom software.

The raw data is held in a database and can be edited with full traceability without compromising the integrity of the original data. Data can also be exported for manipulation in third party programs.

### Energy Expenditure

The analysis software contains a model for calculating energy expenditure using differentially weighted activity and heart rate data.<sup>1</sup>

### Validation

The reliability and validity of the product for recording activity and heart rate as well as the measurement of energy expenditure have been scientifically validated.<sup>2</sup>

### Applications

The Actiheart is ideal for use in the field of sports and exercise science, stress, obesity and other epidemiological applications.

### Bibliography

**1. Søren Brage, Niels Brage, Paul W. Franks, Ulf Ekelund, Man-Yu Wong, Lars Bo Andersen, Karsten Froberg, Nicholas J. Wareham** Branched equation modelling of simultaneous accelerometry and heart rate monitoring improves estimate of directly measured physical activity energy expenditure, *J Appl Physiol* **96**: 343-351, 2004.

**2. Brage S, Brage N, Franks P, Ekelund U, Wareham N J** Reliability and validity of the combined heart rate and movement sensor Actiheart, *European Journal of Clinical Nutrition* **April 2005 Volume 59 No.4**.

**3. Corder, Kirsten; Brage, Soren; Wareham, Nicholas J.; Ekelund, Ulf** Comparison of PAEE from Combined and Separate Heart Rate and Movement Models in Children. *Medicine & Science in Sports & Exercise*. **37 (10):1761-1767, October 2005**.

### Technical Specification

Waterproof: Yes  
 Memory: 512 KB  
 Battery : Rechargeable  
 Battery life: 21 days  
 Weight: 10 grams  
 Size: 32mm dia.  
 6mm depth  
 Warranty: 2 years  
 (Excludes cable damage)



Epoch length	15 sec	30 sec	1 min
Recording time Heart rate with Activity	21 days	21	21
Recording time Heart rate with Activity and IBI Max-Min	10 days	20	21
IBI recording capacity	440,000 beats	-	-

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## Ordering Information

Part	Description	Order code
<b>Actiheart 4</b>	Actiheart units with standard cable. (see note **)	08-305
<b>Actiheart reader</b>	Single channel USB reader charger.	08-314
<b>Actiheart charger</b>	Stand alone 3 Channel Actiheart charger with multi country mains adaptor.	08-326
<b>Actiheart software</b>	Actiheart PC software including energy expenditure.	08-337
<b>Replacement cable</b>	New standard or non standard replacement cable. (See note ***)	08-348

\*\* Non standard lengths must be specified at time of order

\*\*\* Returned to factory or field replacement by user.