Changes in version 1801a compared to previous version 1609a.

EVA analysis:
The 'Analysis setup' menu includes an option 'EVA analysis'. Checking this option initiates the 'activity duration analysis' module which calculates the duration of the activity modes according to an interval classification scheme. For more information, see the document 'EVA analysis by Acti4'.

Export of second by second arm inclination data:
If the measurements include an arm accelerometer and the 'Export activity data' option is selected in the 'Analysis setup' menu, then the exported data also include arm inclination (average value per second).

Changes in version 1807A

Matlab Compiler Runtime version 8.2 (R2013b) must be installed (previous Acti4 versions used version 8.1 (R2013a)).

Recordings by ActivPAL (10 bits resolution) accelerometers are supported (besides Axivity AX3 and Actigraph GT3X).

A procedure for accelerometer calibration is included.

Non-standard accelerometer orientations are supported. During conversion of raw data the accelerometer axes can be shifted (inward/outward, upward/downward or both).

It is optional to record reference positions. If no reference positions is present during analysis, Acti4 estimate internal reference angles for the thigh and trunk accelerometers from mean thigh and trunk angles during walking. The internal references are estimated for each interval of analysis, and are added to the standard analysis output.

Improved detection of cycling – a very upright cycling posture for which the legs did not exceed an average inclination of 40° could be misclassified as walking stairs. An auxiliary cycle detection procedure has been added based on analysis of the frequency distribution of the lateral component of the thigh acceleration.

Heart rate data recorded with BodyGuard2 (Firstbeat) is supported (menu item added in main menu).
In order to get consistency between the handling of Actiheart data and Firstbeat data, the parameter PctBeatErr is redefined as the percentage of time of interval without valid heart rate data.
The parameter NBeatErr is removed.

Changes in version 1908A

In the main menu, an item is added for making Outlier check of results from a batch run including several persons (e.g. all recordings in a project).

In the main menu, an item is added for aggregating results from a batch run, which means that results for several days can be combined/averaged to get a 'per day' result (preliminary).

HRV analysis of heart beat recordings is added (Analysis setup). HRV data are processed in 5 minutes periods based on the intervals in the Setup-file. The output is saved in a separate text file.

A new method has been implemented for filtering of heart rate data. Single ectopic, short or long beats are now corrected while previously deleted.

Accelerometer recordings made by the accelerometer in the Firstbeat heart rate sensor can be included in the activity analysis (substitute for a separate trunk accelerometer).

A HRmax value can be entered in the Setup file (Info sheets), and if present, it will replace the value otherwise calculated from the age.

The threshold between slow and fast walking is no longer fixed to 100 steps per minute, but can be specified in the Analysis setup.

Plots of activity graphs during Batch analysis are saved in bmp format (previously pdf).

Changes in version 2007

Autocalibration of accelerometer recordings (replaces previous procedure).
Calibration of accelerometer recordings can be done during conversion of the raw data to the internal file act4 file format. In addition, previously recorded act4 files can be calibrated (Menu item 'Calibrate act4-files'). A successful autocalibration depends on the presence of different accelerometer orientation without movement throughout the recording.

Synchronization of accelerometer recordings.
A menu item is added 'Synchronize act-files', by which all accelerometers for a measurement can be synchronized to the thigh accelerometer (reference accelerometer). The synchronization procedure relies mainly on presence of periods with walking/running.

In the menu item 'Analysis setup' an option 'Check during batch run' is added. When selected, a check for misorientation of accelerometers are performed (wrong up/down or inside/outside orientation) and an excel sheet is opened with comments on irregular findings. Rearrangement of accelerometer axes (any 90° rotation for the whole measurement) for an act4-file can be done by the menu item 'Rotate axes'. In addition, by means of a special marking of the measurement intervals in the setup-file, it is possible to make an interval selective rearrangement of the axes during batch run.

Support for Sens accelerometer.
A menu item is added for conversion of binary Sens accelerometer recordings.

Calf accelerometer for detection of kneeling position.
In the menu item 'Analysis setup' an option 'Include calf accelerometer' is added. When selected, Acti4 detects kneeling position by using recording from an accelerometer positioned at the leg below the calf. The activity classification shows up in a separate window and the results are saved in a separate output file.

Detection of sleep.
A preliminary algorithm for detection of sleep is included. It is expected that the algorithm actually detects sleeping periods, but inactive (lying) periods without sleep could be misclassified as sleep. The method has not yet been validated.

A bug that could occasionally cause an underestimation of the duration of the activity ‘run’ has been fixed. To assess the significance of the error the daily average duration on ‘run’ was recalculated for a database with 1150 subjects: The duration of ‘run’ was underestimated by more than 1 minute for 2.6% of the subject; the maximum underestimation of the daily average was 10 minutes.

The procedure for aggregating data to get ‘per day’ results has been revised.