The Actiwave Motion User Guide

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Regulatory Information

European Union

The Actiwave is NOT a Medical Device as it does not provide any medical indications. The Actiwave is intended for research purposes only and is NOT indicated for use in clinical applications. Please contact CamNtech UK for advice on application if further clarification is required.

The CE mark is applied to the Actiwave to indicate conformity with the following Directives:

CE

Electromagnetic Compatibility Directive 2014/30/EU.

RoHS2 Directive 2011/65/EU.

WEEE Directive 2012/19/EU.

Manufacturer:

For assistance with set-up, use or maintenance of the Actiwave or to report any unexpected operation or events, please contact CamNtech using the details below or contact your local representative.

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IMPORTANT SAFETY INFORMATION

WARNINGS

- Contains Lithium Battery – DO NOT ATTEMPT TO DISSASEMBLE: No user serviceable parts, danger of chemical hazard if battery is damaged.
- Not Defibrillation proof.
- Not indicated for use on areas of broken, damaged or irritated skin.
- Devices removed from subjects must be considered to be contaminated – see Appendix 1.

Safety Classification Information:

- The Actiwave is **INTERNALLY POWERED EQUIPMENT**.
- The Actiwave mode of operation is **CONTINUOUS OPERATION.**

Device and Packaging Symbols and Markings:

MEANING	SYMBOL	DESCRIPTION
General Warning		Potential hazard -refer to the warnings in the instructions for use (i.e. this user guide).
Consult Instructions for Use		This symbol indicates that important operational information is contained in the user instructions (i.e. this user guide).
Ingress Protection Rating	IP42	The Actiwave is protected against ingress of solid foreign object >=1.0mm dia. And dripping liquids with enclosure tilted at 15°.
Serial Number	SN	This number provides a unique identification for a particular device. Always quote this number when seeking technical assistance.
Catalogue Number	REF	This number identifies this particular variant of the product range.
Manufacturer and Date of Manufacture		This symbol is accompanied by a date in the format ***yyyy-mm*** which indicates when the device was manufactured. The symbol is also accompanied by the address and contact details of the manufacturer
Electrical Safety Classification		The Actiwave is a **TYPE B APPLIED PART**.

FOR FURTHER HANDLING & ENVIRONMENTAL INFORMATION PLEASE REFER TO APPENDIX 1

Contents

1 Introduction to the Actiwave System

1.1 An Overview of the Actiwave System

The Actiwave Motion is designed to offer maximum flexibility for the recording of high resolution raw data accelerometer waveforms. The device is very small and lightweight allowing use at almost any location on the human body. Raw waveform data are captured by the device and presented as either EDF+ format or CSV format allowing straightforward import into your preferred post-processing software. A range of mounting straps provides a solution for common body locations such as waist, ankle or wrist.

Components required for a system

The Actiwave system consists of 3 main components:

- One or more Actiwave Motion recorders.
- MotionDock USB Interface Dock.
- PC Software providing set-up, download and maintenance functions.

Actiwave Motion

MotionDock

1.2 Contraindications

The Actiwave is indicated for use on healthy, undamaged areas of skin. Where the subject has a history of skin irritation, a sample device should be tested for skin irritation prior to commencing any recording.

1.3 Required Skills, Training & Knowledge of Intended Users.

It is intended that the device be administered only by duly qualified health care professionals or researchers.

1.4 General Principle of Operation

The Actiwave is NOT a Medical Device as it does not provide any medical indications. The Actiwave is intended for research purposes only and is NOT indicated for use in clinical applications. The Actiwave measures physical movement by means of a high resolution, tri-axial accelerometer. The signals are measured by the Actiwave and are stored within an internal non-volatile memory.
The Actiwave Motion is typically worn by the subject during their normal daily activities for a period of up to 7 days thus providing a benefit over lab based systems which only provide a short ‘snapshot’ of activity.

2 Installing the Actiwave Software

2.1 System Requirements

The Actiwave software is provided via download (A USB stick can optionally be provided at extra cost). The installer contains all of the components required to install the software package. The following are the minimum requirements of a host PC for installing the Actiwave software:

- Windows® 8 or 10, 32 or 64bit operating systems.
- IBM compatible 2GHz + processor speed recommended
- 500 MB hard disk space
- One free USB port
- SVGA graphics card (1280 x 1024) recommended.

CamNtech recommends the following minimum security requirements for the host PC:

- Use of strong user login passwords
- Enabling of automatic Windows updates
- If the host PC is networked, use of Windows Firewall (or third-part alternative) – ensuring updates applied
- Use of Windows Defender anti-malware (or third-party alternative) with automatic definitions updates enabled.

CamNtech recommends that the Actiwave is not connected to any PC other than a dedicated host PC which meets the above requirements and is running the Actiwave software.

2.2 Software Registration

To access the Actiwave software download, it is necessary to first register the software with CamNtech. Please visit www.camntech.com/register to register your software using the reference number provided with your equipment. You will then be provided with a username and password allowing log-in and download of the software at any time during the two year warranty period.
Note that CamNtech standard software licensing allows up to 3 users to register and use one copy of the software.
The software will continue to be fully functional beyond the warranty period but updates will no longer be provided.

2.3 Installing the Software

Download the installer (.msi) from the CamNtech website: www.camntech.com/downloads
Double click on the downloaded .msi file to run the installer then follow the installation process.
A message warning that 'Publisher cannot be verified' may be displayed – click 'Run' to accept (this is a Windows security warning and is not a problem).

The software should **not** be started until you have connected the reader and installed the drivers required by the USB reader charger (see Section 2.5).
Please note the copyright warning. By accepting this, the user is accepting the CamNtech terms and conditions of use of the Actiwave software

2.4 Updating the software.

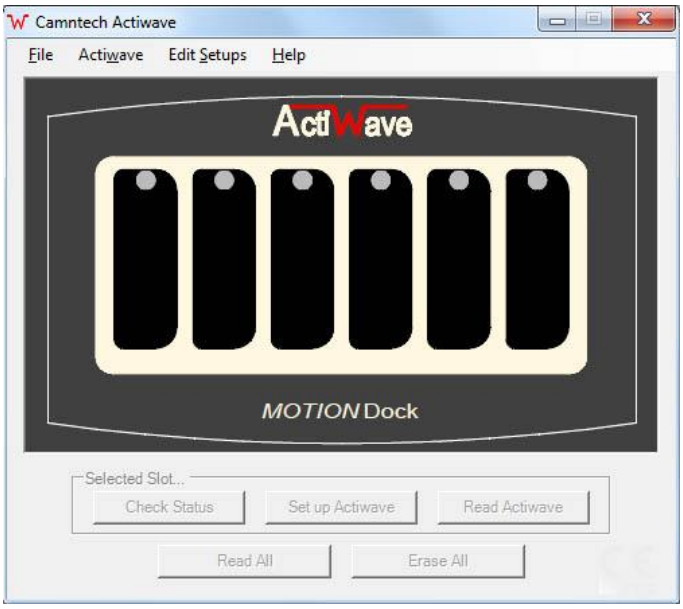
If you are updating or reinstalling the software you should remove the old version first when prompted by the installation wizard. The installation has to then be restarted by double-clicking on the Actiwave.msi installer file.

2.5 Installing the USB drivers for the Interface Dock

The MotionDock USB driver installation will be automatic. Ensure that the PC has an internet connection and then connect the Interface Dock. The device will be detected and the drivers should load with no user intervention. Wait for the drivers to complete their installation before starting the Actiwave Software.
If there is no internet connection please consult Appendix 2 for USB driver installation.

2.6 Running the Software for the first time

Double click on the Actiwave icon on the desktop to start the software. If a dock is plugged in it should be detected and a view of it shown on screen. Three types of interface dock are shown in the figures below:


Camntech Actiwave
File
Actiwave
Edit Setups
Help
ActiWave
MOTION Dock
Selected Slot...
Check Status
Set up Actiwave
Read Actiwave
Read All
Erase All

3 Connecting the Actiwave & Charging the Battery

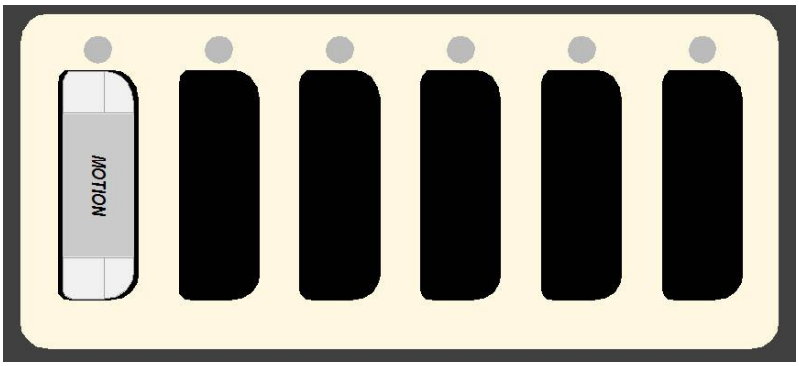
3.1 Overview

Before the Actiwave is used for data collection, the user must ensure that it is fully charged. A depleted battery may result in an incomplete recording as the Actiwave may shut down before data collection is complete. If the battery is below 3.7V, a warning message will be displayed if set-up is attempted.

The Actiwave contains a lithium polymer rechargeable battery. The expected duration of the battery from fully charged is dependent on the sample rate and corresponds with the recording time (see section 5 for recording times). The Actiwave may be recharged via the USB port of the Host PC or using a standard mains adaptor with a USB Type A connection (e.g. those used with MP3 players etc.).

3.2 Correct orientation and position in the dock

The Actiwave Motion must be correctly oriented and located within the slots of the interface dock. The Actiwave devices have a profiled case to ensure correct orientation. Always take care to align the sockets on the Actiwave with the pins inside the slot and do not use excessive force or the pins may be damaged.

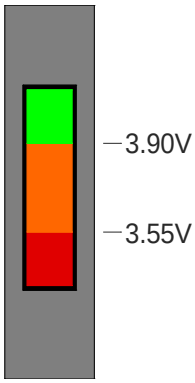


3.3 Charging the Actiwave from the PC

There are two modes of operation when the dock is connected to the PC (and the PC is switched on):

1. **Stand-alone mode:** The Actiwave software is not running; the Actiwave devices are charged and their charge status is indicated by the LEDs on the dock. While the Actiwave is charging, the LED will be RED. When the

Approximate Voltage indicated by charge gauge



Actiwave is charged, the LED will stay GREEN. Note that the status will alternate between charged/charging as the charge level rises, and occasionally show red in order to maintain full battery charge.

2. **Managed Mode:** In this mode, the Actiwave software is running on the PC. The main display will show a bar graph of the approximate battery level on the respective channel.

An Actiwave which has been used should be left charging on the reader for a period of several hours (i.e. overnight), if you require it fully charged. The estimated battery level shown may not be fully accurate during charging itself, so it is advisable to leave the unit connected and charging for some time if the indication has reached green after only a short period.

3.4 Charging using the Mains Power Supply

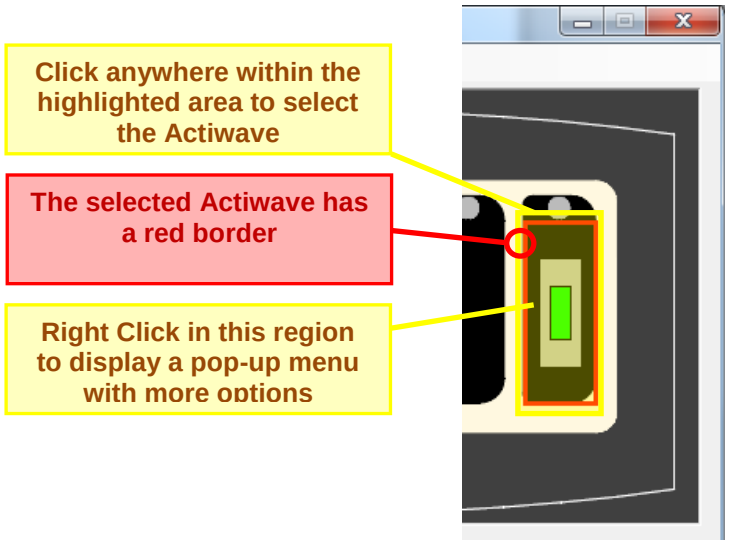
The Actiwave Dock is supplied with a 5V USB mains power adaptor which is safety approved to EN60950-1 and EMI standard EN55022 (also FCC part 15, Class B). This adaptor is supplied with appropriate adaptors to suit mains outlets in most world regions.

To charge the Actiwave devices using the mains adaptor the USB cable provided should be plugged into the mating socket on the mains adaptor.
The dock will operate in ‘stand alone mode’ with Actiwave charge status indicated by means of the front panel LED’s (see ‘Stand alone mode’ above).

4 Selecting an Actiwave and Viewing Status.

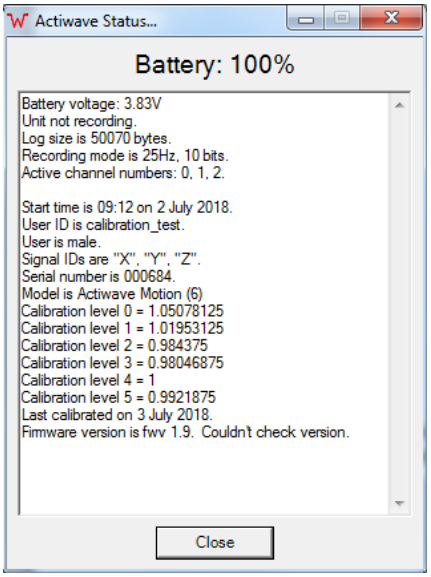
4.1 Selecting an Actiwave

To select a docked Actiwave, click on the image of the required device (see figure below). The selected Actiwave will be outlined in red and the corresponding LED on the dock will flash amber. The user may then either use the options in the top menu bar, the buttons at the bottom of the screen or right click to bring up a small menu.



4.2 Viewing Actiwave Status

Having selected the required Actiwave, click the 'Check status' button (or right-click on the required Actiwave image and select 'Check status' from the pop-up menu) will display the window below.

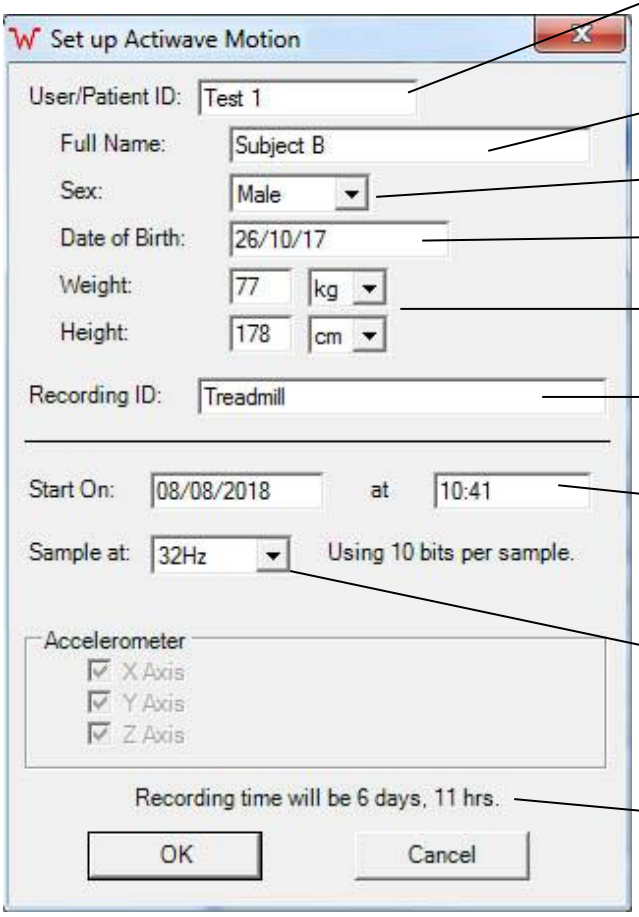


This window provides information about the battery voltage, details of the current device settings, details of the recording and technical information about the Actiwave.

5 Set-up an Actiwave Motion for a Recording

5.1 Actiwave Set-up

Select the required Actiwave from the main screen and then click ‘Set up Actiwave’. Note that the previous recording will then be erased. Note that there is a limit of approximately 50 characters shared across the User ID, Full name, DOB, recording ID and channel names. A warning message will be displayed if the limit is exceeded and the set-up will not be written to the device.



Required – enter user or subject identification information.

Optional – When using an ID, the full subject name can be entered here.

Optional – Select the subject gender

Optional – Enter subject DOB

Optional – Enter subject weight & height

Optional – Enter information to uniquely identify this recording

Required – Start date and time must be entered. Start can be delayed for up to 1 month.

Required – Select the sample rate: 32Hz, 64Hz, 25Hz, 50Hz or 100Hz

Total recording time will be displayed as the settings are changed.

5.2 Completing the setup

Click on the ‘OK’ button to store the setup to the Actiwave unit. The software will confirm when it is configured and show the programmed start time.

The Actiwave can now be removed and attached to the subject. If a long start delay has been set the Actiwave will enter a low power sleep mode until it needs to start logging.

5.3 Erasing the Actiwave Memory

Before set-up, the Actiwave memory must be erased - this can take a few minutes to complete depending on the amount of memory used in the previous recording.

When preparing to set-up several Actiwave devices, a faster option is to us the ‘Erase All’ button. This will begin erasing the memory in all connected Actiwave devices simultaneously. The Actiwave devices can now be individually set-up as above, and there will be no delay for the erase step.

NOTE: Beginning a new set-up or erasing the Actiwave will result in loss of any existing stored data or set-up information – please ensure that any required data has been downloaded first.

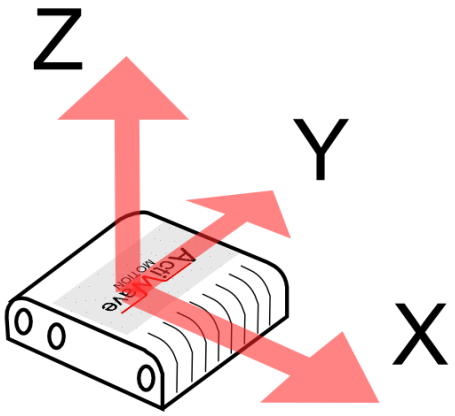
6 Preparing for an Actiwave Motion recording

6.1 Mounting

The Actiwave MOTION may be mounted in any required position on the subject. The quick release belts / mountings are available in several sizes to allow comfortable fitment to the waist, torso, upper arm, thigh or ankle. Adjust the length of the mounting strap to keep the device from moving but without causing discomfort for the subject.

6.2 Orientation

The figure below shows the orientation of the three axes relative to the case markings.



6.3 Sampling & Recording Times

The sampling rate is very dependent upon the application. High sampling rates lead to high data resolution but with a more limited recording time. The table below shows the recording time for the different sampling rates of the Actiwave Motion. Resolution is fixed at 10 bits, X, Y and Z axes always enabled.

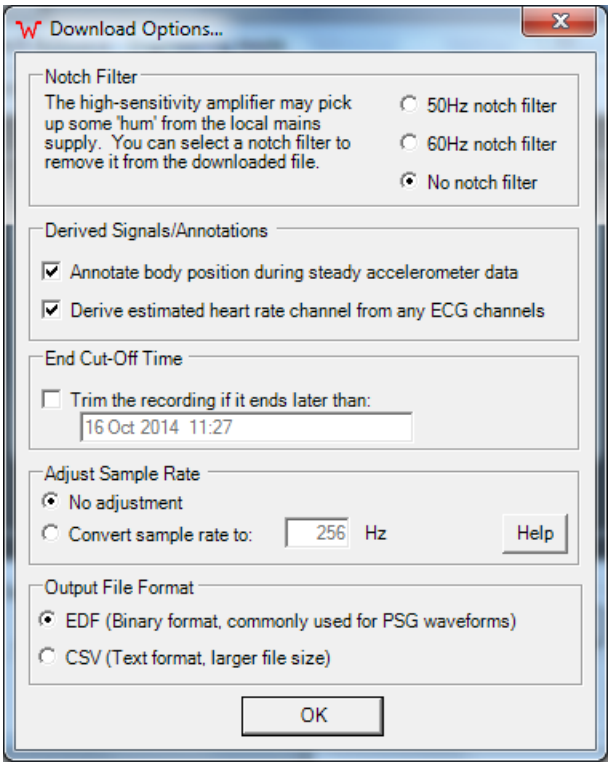
Sample Rate (Hz)	Recording Time
25	7 days, 0 hours
32	6 days, 11 hours
50	4 days, 3 hours
56	3 days, 5 hours
100	2 days, 1 hours

Note: Physical Activity is not a medical indication

7 Downloading data

7.1 Download options

Select the appropriate channel and then click on the ‘Read Actiwave’ button. The following window will appear:



Notch Filter

Mains pickup is not usually a problem with the Actiwave devices. They are isolated and will not normally pick up signal from mains supplies. However, any mains pickup that does occur can be removed by selecting the appropriate filter for your local mains frequency.

Derived Signals / Annotations

The derived parameters are body position. The body position can only be calculated when there is no movement and is applied as an annotation in the EDF file. If you require a more sophisticated algorithm and measurements then there are specialist programs available that will carry out this work.

End Cut-Off Time

Some analysis requires The data can be trimmed so that large amounts of unwanted data need not be downloaded and stored. For example, An overnight recording may be needed until 7am but not actually read until 10am. If the data is not trimmed then 3 hours of unwanted recording will be downloaded and stored.

Adjust Sample Rate

This function will resample the downloaded data to a different frequency using a natural cubic spline. This allows you to use the Actiwave with software which expects input samples using a different frequency. Most analysis packages will not have this limitation, so you will not need to use this function. You can enter any whole number sampling frequency of at least 100Hz.

Output File Format

After the data is downloaded, it can be saved in two different standard file formats.

The EDF format is a standard format used for EEG files and similar, and can be loaded in many software packages. The details of this format are available at: http://www.edfplus.info/.

The CSV format is a text file listing all of the data samples separated by commas, which can be loaded directly into a spreadsheet. However, it is significantly larger and may be slower to handle as a consequence.

7.2 Completing the Download

Having selected the appropriate options, click on the 'OK' button to download the Actiwave. Data is downloaded at 2Mbit per second from the Actiwave device. Even at this speed the data download may take a few minutes for a full memory. After downloading, the data is processed if required to apply any of the filters/annotations described above. The data is then saved using a default filename which is made up from the setup information and the download date. The user may change this filename before storing.
The recorded data in the Actiwave device is **not erased** after download. It is only erased if the unit is set up again or erased using the erase all option.

7.3 The 'Download All' Option

This function downloads data from all the Actiwave devices in the interface dock and stores them in different sequentially numbered files. The download options need only be selected once and then no further user intervention is required.

7.4 Viewing the Saved Data

Selecting a file to view

When a file has been downloaded the user may view the data by using the file menu. The last 4 files downloaded are available on this menu. When a relevant file viewer is installed it should automatically link the EDF or CSV extension to itself. This allows you to open your files using the viewer of your choice.

Detailed Analysis of EDF files

EDF compatible analysis packages available include:

- VivoSense
  - http://vivonoetics.com/products/vivosense/
- Polyman
  - www.edfplus.info
- Biopac
  - www.biopac.com
- Sciworks from Datawave
  - www.dwavetech.com
- Labscribe from iWorx
  - www.iworx.com/research/software/

Free EDF file viewers

A number of free EDF viewers are available including Polyman, EDFbrowser, jEDF, OpenXDF Viewer, etc. CamNtech recommends Polyman, which is available in a free version from: http://www.edfplus.info/downloads/downloads.html. Many more advanced commercial packages are available for loading and analysing EDF files

8 FAQ & Troubleshooting

What limits the memory size?

Large flash memories are very power hungry. Erasing and writing a large memory array would severely affect the battery life. Writing to the memories is the main source of battery drain even with the low power serial flash we use.

What limits the download speed?

In order to keep the power consumption to a minimum a low power low speed processor is required. It cannot send data any faster than this. The download and saving of the data to disc also takes considerable time even on a fast PC.

Is data compression used?

No. Data compression takes a lot of processing power and no algorithm is able to guarantee 100% true reproduction of the waveform whilst compressing. This means that depending on the choice of algorithm, either the waveform could be altered in an unpredictable manner, or the device may not record for as long as the user is expecting. We do not know the users application so we do not wish to lower the integrity of the data. Data compression algorithms always need to be applied with care taking into account the intended analysis methods.

Why do the first few seconds sometimes show a DC offset

To conserve power the Actiwave unit powers down during the start delay. When it powers up to start storing data the amplifiers need a few seconds to settle.

How synchronous are the channels?

The waveforms on one unit are all recorded within a hundred microseconds. The variation between units is less than 0.5 seconds when set up, although larger drift may occur over a long recording.

The Actiwave Dock is not recognised or will not communicate:

The most likely cause of problems will be due to the USB drivers. Windows will sometimes automatically try to choose the wrong driver during installation or may in some other way fail to install the drivers correctly. See Appendix 2 for advice on installing the USB drivers manually.

The software offers to update the Actiwave firmware – what does this mean?

The Actiwave Software is shipped with the latest device operating firmware. If the software detects that any Actiwave has older firmware, it will inform you that an update is available. It is recommended that firmware updates are applied to ensure that you benefit any improvements to the device. Follow the on-

screen instructions to update the firmware and do not remove the device or interrupt the process.

I have two or more EDF files that I wish to join together – how do I do this?

See Appendix 3: Joining EDF files.

The Actiwave won't communicate and I get a message about 'A device which may be an Actiwave has been detected':

The battery in the Actiwave is below the level required to communicate. This message is a safety warning to prevent users of other CamNtech products attempting to use the wrong interface. Leave the Actiwave in the dock to charge and check again later.

What are the potential effects of Electromagnetic interference?

The Actiwave system was designed to minimise the effects of external EMI upon the device and to minimise the effect upon the environment from the device. The system conforms to the appropriate standards with respect to EMI performance (see section 11.7). In cases where strong EMI does affect the Actiwave, the device will recover with no user intervention.

Appendix 1 - Handling & Environmental Information

A1.1 Decontamination

- Devices removed from subjects must be considered to be contaminated.
- The operator must use gloves to handle such devices before and during de-contamination.
- The Actiwave casing, cable and clip must be carefully cleaned with alcohol wipes to minimise any potential contamination.
- Take care not to place excessive stress on the cable assembly during cleaning.

A1.2 Battery Care

- The device is INTERNALLY POWERED and operates at voltages below 4VDC; there is hence no risk from electric shock (equipment Type B).
- The battery is **NOT** user replaceable – **no attempt should be made to open the device casing**.
- The battery is re-chargeable; to maximise the service life of the battery:-
  - Following download of data, always fully re-charge the Actiwave.

A1.3 Disposal

Waste Electrical & Electronic Equipment (WEEE) The EU requires, under the Waste Electrical and Electronic Equipment Directive 2012/19/EU, that manufacturers and/or distributors of Electronic and/or Electrical Equipment manage and pay for the collection and further handling of WEEE products, as well as provide WEEE-related information to their customers.

CamNtech has taken the following approach to complying with this Directive:

- CamNtech has registered with an approved producer compliance scheme (PCS) in accordance with the requirements of the WEEE Directive.
- CamNtech will provide free recycling for all of its WEEE products when returned to them.
- CamNtech WEEE products will be designed with recycling, reuse and waste management as a consideration.
- CamNtech WEEE products will be labelled or stamped with the WEEE marking in accordance with European Standard EN 50419

A1.4 ENVIRONMENTAL

The Actiwave must be used and stored in accordance with the following environmental conditions:

	Operating	Storage & Transport*
Temperature	+5ºC to +40ºC 41ºF to 104ºF	-25ºC to +70ºC -13ºF to 158ºF
Relative Humidity	15% to 93% Non-condensing	15% to 93% Non-condensing
Atmospheric pressure	700hPa to 1060hPa	

*Applies while packaged within manufacturer supplied packaging and after having been removed from packaging and subsequently between uses.

A1.5 EMC Guidance & Declaration

The following tables provides compliance and user guidance regarding Electromagnetic compatibility of the Actiwave system.

A1.5.1 Electromagnetic Emissions

Guidance and Manufacturers Declaration – Electromagnetic emissions		
The Actiwave is intended for use in the electromagnetic environment specified below. The customer or the user of the Actiwave should assure that it is used in such an environment.		
Emissions Tests	**Compliance**	**Electromagnetic environment - guidance**
RF Emissions CISPR 11	Group 1	The Actiwave uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
RF Emissions CISPR 11	Class B	The Actiwave is suitable for use in all establishments, including domestic establishments and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic Emissions EN61000-3-2	Not Applicable	
Voltage Fluctuations / flicker emissions EN61000-3-3	Not Applicable	

A1.5.2 Electromagnetic Immunity

Guidance and Manufacturers Declaration – Electromagnetic Immunity			
The Actiwave is intended for use in the electromagnetic environment specified below. The customer or the user of the Actiwave should assure that it is used in such an environment.			
Immunity Test	**IEC 60601 Test Level**	**Compliance Level**	**Electromagnetic environment - guidance**
Electrostatic Discharge (ESD) IEC 61000-4-2	+/-6kV Contact +/-8kV Air	+/-6kV Contact N/A (#1)	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material. The relative humidity should be at least 30%.
Electrical Fast Transient/burst IEC 61000-4-4	+/-2kV for power supply lines +/-1kV for input/output lines	+/-2kV for power supply lines +/-1kV for input/output lines	Mains power quality should be that of a typical commercial or hospital environment.
Surge IEC 61000-4-5	+/-1kV differential mode +/-1kV common mode	N/T (#2) N/T (#2)	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	<5% U_T (>95% dip in U_T) for 0.5 cycle. 40% U_T (60% dip in U_T) for 5 cycles. 70% U_T (30% dip in U_T) for 25 cycles. 5% U_T (95% dip in U_T) for 5 seconds.	N/T (#2) N/T (#2) N/T (#2) N/T (#2)	
Power frequency 50/60Hz magnetic field IEC 61000-4-8	3 A/m	3 A/m	Power frequency magnetic fields should be at levels characteristic of a typical location in a typical commercial or hospital environment.
NOTE - U_T is the a.c. mains voltage prior to application of the test level.			

#1: Test not applied because contact discharge could be applied to all points.

#2: Not tested because the 2 operating modes where essential operation is important do not have a mains connection.

Guidance and manufacturer's declaration—electromagnetic immunity			
The [EQUIPMENT or SYSTEM] is intended for use in the electromagnetic environment specified below. The customer or the user of the [EQUIPMENT or SYSTEM] should assure that it is used in such an environment.			
Immunity test	**IEC 60601 test level**	**Compliance level**	**Electromagnetic environment—guidance**
Conducted RF IEC 61000-4-6	3 Vrms 150 kHz to 80 MHz	$[V_1]$ V	Portable and mobile RF communications equipment should be used no closer to any part of the [EQUIPMENT or SYSTEM], including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter. **Recommended separation distance** $d = [\frac{3.5}{V_1}] \sqrt{P}$
Radiated RF IEC 61000-4-3	3 V/m 80 MHz to 2.5 GHz	$[E_1]$ V/m	$d = [\frac{3.5}{E_1}] \sqrt{P}$ 80 MHz to 800 MHz $d = [\frac{7}{E_1}] \sqrt{P}$ 800 MHz to 2.5 GHz where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in meters (m). Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey,[a] should be less than the compliance level in each frequency range.[b] Interference may occur in the vicinity of equipment marked with the following symbol: 
NOTE 1—At 80 MHz and 800 MHz, the higher frequency range applies. NOTE 2—These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects, and people.			
[a] Field strengths from fixed transmitters, such as base stations for radio (cellular/cordless) telephones and land mobile radios, amateur radio, AM and FM radio broadcast, and TV broadcast cannot be predicted theoretically with accuracy. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the measured field strength in the location in which the [EQUIPMENT or SYSTEM] is used exceeds the applicable RF compliance level above, the [EQUIPMENT or SYSTEM] should be observed to verify normal operation. If abnormal performance is observed, additional measures may be necessary, such as re-orienting or relocating the [EQUIPMENT or SYSTEM]. [b] Over the frequency range 150 kHz to 80 MHz, field strengths should be less than $[V_1]$ V/m.			

Example: For a typical mobile phone, the radiated RF will be in the 80MHz to 2.5GHz band and if the transmission power were 1W, the separation distance should be at least 2.33 meters.

Appendix 2 – Installing USB Drivers Manually

If you have no internet connection on the PC where the software is installed

The Drivers normally automatically download from Microsoft update, however this requires an active internet connection.
Use a different PC to visit our website at https://www.camntech.com/support/drivers and download the drivers package or download from the link below:

https://www.camntech.com/images/downloads/Driver/CDM20830_Setup.exe

- If you have difficulty, visit our website at https://www.camntech.com/support/drivers and follow the instructions.

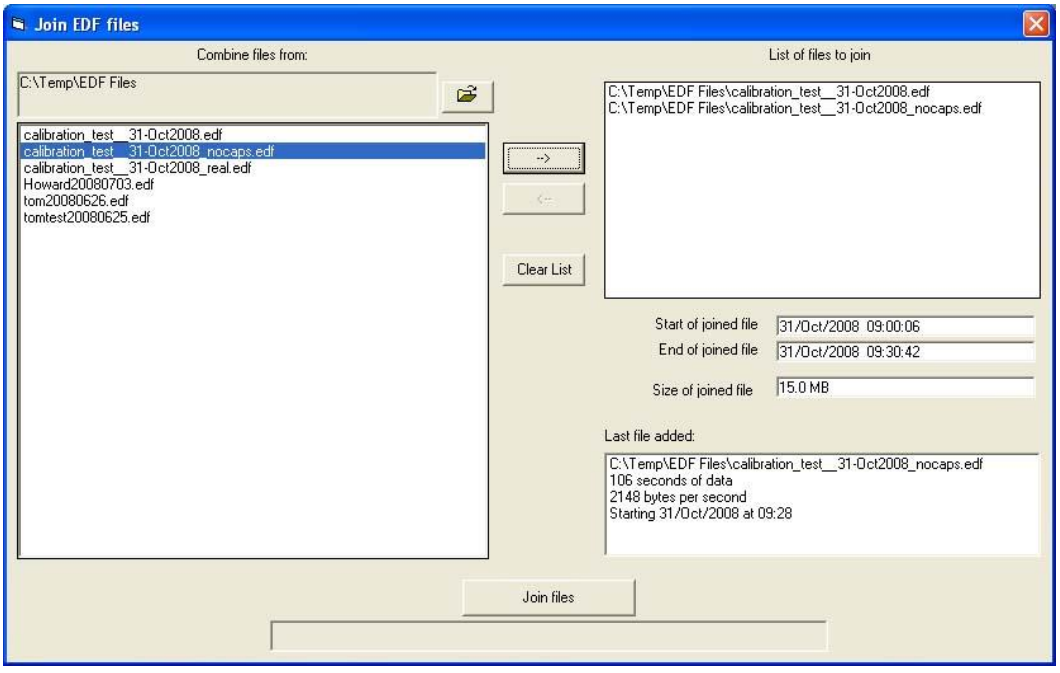
Appendix 3 – Joining EDF Files

Introduction

The Actiwave software installation contains a utility to allow the joining of EDF files produced by Actiwave devices.
In the Start menu of the PC, locate the program 'EDFjoin' (this should be grouped within the Actiwave folder).
If there is no Start menu entry or shortcut to this program, locate and run the file EDFjoin.exe in the Actiwave installation folder.

Using EDFjoin

The folder defaults to the one where you have been storing files in the Actiwave software. To select an alternative folder, click on the browse (folder icon) button. A list of EDF files is displayed in the left hand list. Click on a file in the left hand list then click the add button [->] to add it to the 'list of files to join'. To remove a file from the right hand list, select it then click the remove button [<-]. The start date/time and end date/time of the joined file is displayed along with the file size. Selecting files that do not overlap will create a very large file; check the length of the joined file before you start the joining process.
The output file name will be that of the first file in the 'join' list with '_joined' appended.
To complete the process click on the 'Join files' button.
The process can take a few seconds and progress of the operation is shown by a progress bar at the bottom of the screen.



Document Revision History

Issue From	Issue To	Date	Description	Initiator
0.0	1.0	16/05/08	First Issue	GSU
1.0	1.1	26/09/08	Updated to reflect current software modifications	GSU
1.1	1.2	20/05/09	Revisions to add appendices, improved formatting, additional safety and regulatory information added.	HS
1.2	1.3	24/06/09	Further safety information added.	HS
1.3	1.4	25/06/09	Further safety information added.	HS
1.4	1.5	08/07/09	CE mark with NB number added to page 1	HS
1.5	1.6	27/09/09	Formatting changed to corporate style	HS
1.6	1.7	11/01/10	Corrected minor formatting errors, added installation splash screen	HS
1.7	1.8	27/04/10	Added EMC declaration and guidance tables (section 11.7)	HS
1.8	1.9	25/05/12	Revisions for 3rd edition EN60601-1 and related collateral standards	HS
1.9	1.10	15/01/13	Added EC Declaration of conformity to Appendix 1	HS
1.10	1.11	12/02/13	Corrected some formatting and TOC errors, moved rev history to end of manual	HS
1.11	1.12	20/2/14	Removed EU DofC, revised Motion section	HS
1.12	2.0.2	1/10/14	Changed memory erasing instructions. Added motion orientation. Added CSV format output.	TE
2.0.2	2.0.3	29/03/16	Added table of sample rate options for Cardio to section 11	HS
2.0.3	2.0.4	12/01/17	EU device classification changed – not a medical device in the EU or EEA.	HS
2.0.4	2.0.16	08/08/18	Removed legacy 1, 2, 4 devices and moved Cardio to separate document. This user guide now refers only to the Actiwave Motion.	HS
2.0.16	2.1.2	28/11/19	Updated CamNtech address details, updated installation section	HS