

WEARABLE PHYSICAL ACTIVITY & SLEEP MONITORING SOLUTIONS



A GLOBAL LEADER IN OBJECTIVE MEASUREMENT SOLUTIONS

ActiGraph is a leading provider of objective physical activity and sleep/wake measurement solutions for the global scientific community. Our industry validated accelerometry devices and innovative software tools deliver accurate, measurable insights into the real-world behaviors of subjects involved in a wide variety of academic and clinical research studies.



HEALTH RESEARCH

The “Gold Standard” in physical activity measurement

ActiGraph’s ambulatory monitoring hardware and software products have been used for nearly 20 years to capture physical activity and sleep data in thousands of large-scale health research, epidemiology, and disease state studies involving obesity, diabetes, cardiovascular disease, cancer, and sleep disorders.*

* ActiGraph products are not intended to diagnose, treat, cure, or prevent any disease.



CLINICAL TRIALS

Improved data quality, efficiency, and cost effectiveness

Deployed within a clinical drug trial, ActiGraph solutions deliver real-world patient data and comprehensive site and study management tools, so trials run more efficiently and sponsors and investigators can make faster, better informed decisions based on high quality data.



SLEEP ASSESSMENT

Noninvasive in-home sleep/wake monitoring

Our actigraphy monitoring solutions are widely used by sleep researchers and clinical care providers to continuously monitor sleep behavior, bedtime routines, and rest-activity rhythms of subjects in their natural home environment.

WEARABLE SOLUTIONS

Backed by nearly 20 years of independent scientific validation, ActiGraph's wearable accelerometer-based activity monitors are among the most accurate and widely used devices of their kind.



CentrePoint Insight Watch

The new CentrePoint Insight Watch features ActiGraph's raw data capture technology combined with real-time connectivity, and the streamlined design, comfort, and utility of a consumer smartwatch. The Insight Watch has an extended 30-day battery life and is capable of performing automated, wireless raw data uploads when used in conjunction with the CentrePoint Data Hub or mobile app.

The CentrePoint Insight watch can only be used with the CentrePoint software and is not compatible with ActiLife.



ActiGraph GT9X Link

Featuring a sleek, low profile case and high resolution LCD window for optional real-time subject feedback, the ActiGraph GT9X Link contains a gyroscope, magnetometer, and secondary accelerometer to provide additional information about movement, rotation, and body position for advanced research applications.



ActiGraph wGT3X-BT

ActiGraph's flagship activity monitor is used by researchers around the world to capture and record continuous, high resolution physical activity and sleep/wake information. The wGT3X-BT features ActiGraph's validated 3-axis accelerometer and digital filtering technology and includes integrated wear time and ambient light sensors.



Wear Time Sensor

Integrated sensor detects when a wrist-worn monitor has been removed for simplified compliance verification and data cleaning.



Programmable Display

A programmable LCD window can be configured to display date and time, optional real-time feedback, or it can be completely disabled.



Heart Rate Monitoring

Capture heart rate BPM and R-R intervals using a compatible Bluetooth® wireless heart rate monitor.



Mobile & Wireless Data Uploads

Subjects can upload collected data via mobile device or CentrePoint Data Hub for remote compliance and behavior monitoring. (CentrePoint platform only)



Proximity Tagging

Record the presence of other nearby devices, useful for tracking a subject's interaction with their environment and/or other subjects.



Ambient Light Sensor

An integrated light sensor captures and records light intensity information, providing insights into the relationship between environment and physical activity and sleep behaviors.



Accurate & Reliable Objective Measures

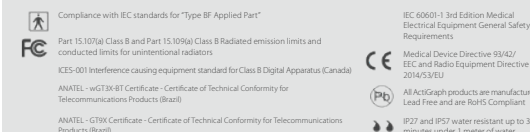
ActiGraph activity monitors capture and deliver continuous, 24-hour physical activity and sleep/wake measures including:

- Raw Acceleration (G's)
- Energy Expenditure (kcal/s)
- MET Rates
- Steps Taken
- Physical Activity Intensity
- Heart Rate R-R intervals*
- Body Position
- Sleep Onset
- Sleep Latency
- Total Sleep Time
- Wake After Sleep Onset
- Sleep Efficiency

* Requires compatible Bluetooth® heart rate monitor

Specifications	CentrePoint Insight Watch	ActiGraph Link	wGT3X-BT
Dimensions	1.97 x 1.35 x 0.41 in	3.5 x 3.5 x 1 cm	4.6 x 3.3 x 1.5 cm
Weight	14 grams	14 grams	19 grams
Sample Rate	32-256 Hertz	30-100 Hertz	
Dynamic Range <small>Primary Accelerometer</small>	+/- 8G		
Dynamic Range <small>Secondary Accelerometer</small>	N/A	+/- 16G	N/A
Gyroscope Dynamic Range	N/A	+/- 2000 deg/sec	N/A
Magnetometer Dynamic Range	N/A	+/- 4800 micro-Tesla	N/A
Battery Life	30 days	14 days ¹	25 days
Data Storage	30 days ¹ /512MB	180 days/4GB	
Communication	USB, Bluetooth® LE 5	USB, Bluetooth® LE	
Water Resistance	IP57 1 meter, 30 min	IP27 1 meter, 30 min	
Wear Location	Wrist	Wrist, waist, ankle, thigh	
Warranty	1 year		

ActiGraph monitors are FDA cleared Class II medical devices within the United States and abide by numerous regulatory requirements, including:



1. Wireless disabled, 30-32 Hz sample rate, IMU disabled, sleep mode

SOFTWARE SOLUTIONS

Our powerful software platforms offer the ease and flexibility of a cloud-based system and a variety of advanced, customer-driven data processing and analysis tools.



CENTREPOINT

Cloud-Based Data Capture and Management Platform

ActiGraph's cloud-based CentrePoint software platform delivers real-world subject data in near real time, while solving many of the common operational and logistical challenges associated with complex, multi-site studies.



Simple Setup & Deployment

This web-based platform lets you get new research sites up and running with ease. With automated device assignments, uploads, and data scoring, CentrePoint requires minimal personnel training and IT resources.



Standardized, Error-free Data

Customized study preconfiguration prevents setup errors that can result in missing or incomplete data. All study data are standardized, time-synchronized, and stored securely in the cloud, while an audit trail provides a record of all system interactions.



Remote Compliance Monitoring

Home-based data uploads via PC, mobile device, or CentrePoint Data Hub allow investigators to monitor subject compliance and activity and sleep behavior during the data collection process.



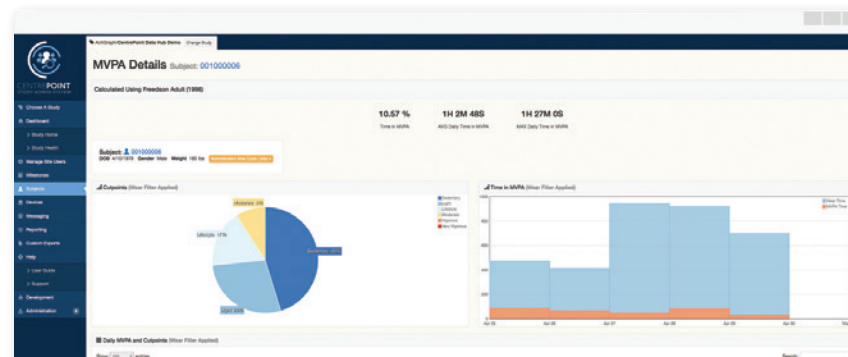
Flexible Data Output

CentrePoint provides three levels of data output - raw signal data, filtered epoch data, and derived activity and sleep measures - to provide researchers with maximum analytic flexibility.



CentrePoint Data Hub

This home-based cellular communication gateway securely transmits activity monitor data from the subject home to the CentrePoint Cloud, where it can be instantly accessed by the study team. The CentrePoint Data Hub can also be used as an activity monitor charging station for extended periods of data collection.



Real-time Visibility of Subjects & Sites

Instant visibility of subject measures, site metrics, and overall study progress helps the research team quickly identify and address issues to help keep the study running on time and on budget.



Integration with ActiLife

Seamless integration with ActiLife offers users the convenience and real-time, remote data access of a cloud system, along with ActiLife's powerful suite of advanced analysis tools.



CentrePoint API

Direct REST API access is available for all CentrePoint endpoints including raw (minute-by-minute) data (captured from devices via mobile uploads or direct connect) as well as post-processed outcomes for each subject.



CentrePoint Mobile Apps

The Site Assistant mobile application for iPad allows research personnel to assign CentrePoint Insight Watches remotely, while the Patient Connect app for iOS and Android allows subjects to upload Insight Watch data to the CentrePoint system using a mobile device.

ACTILIFE

Powerful & Robust Data Analysis Platform

ActiLife is ActiGraph's premier actigraphy data analysis software platform. Developed in collaboration with members of the global research community, the ActiLife desktop program provides users with high resolution raw data files, a powerful batch processing engine, and an extensive selection of client-driven analysis tools to support a broad range of research objectives.

File Edit Tools Help
Devices Wear Time Validation **Scoring** Sleep PLM Graphing NHANES GPS Feature Extraction Studies Data Vault

Algorithms
☒ Energy Expenditure ¹

Freedom Combination (1998)

↓

☒ METs ²

Freedom Adult (1999)

↓

☒ Cut Points and MIPA ³

Freedom Adult (1998)

↓

☒ Bouts ^{edit...} ⁴
☒ Sedentary Analysis ^{edit...} ⁵
☐ HRRF ⁶
Filters (All-Inclusive)
☒ Exclude Non-Wear Times from Analysis
☐ Use Subject Log Diaries ^{import...} ⁷
Global Date and Time Filters ⁸

Add Dataset(s)... Remove Selected Edit Columns...

Files loaded: 39

	Data Set	Subject N...	Serial Number	Details	Validated Date?	Log Diary
<input checked="" type="checkbox"/>	10_12016-09-1610Data.xlsx	Ann Mari...	MC52A08140376	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	10_12016-09-1610Data.xlsx	Ann Mari...	MC52A08140376	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	Gt14803_Device1_2_14_11_Pinned.xls	OW1490...	MATC218100272	Details...	Automatic (2/26/2015)	View Log Di...
<input checked="" type="checkbox"/>	10101 (1).xls	10101 (1)	LYN821070068	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	10880 (2012-02-01).xls	10880	LYN826070007	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	Gt13028_recreat_device2_3_8_11.xls	OW1302...	MATC218100259	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	118196HRL2_0120-01-10.xls	118196g...	MATC219090459	Details...	Automatic (2/26/2015)	View Log Di...
<input checked="" type="checkbox"/>	Demo Organization-Idema Mock Study - 000105.xls	Demo Or...	CL62829130512	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	1st night Kiut Left Test 10ae.xls	1st night...	MRA1C18110245	Details...	Automatic (2/26/2015)	None
<input checked="" type="checkbox"/>	1st night Kiut Left Test 2.xls	1st night...	MRA1C18110245	Details...	Automatic (2/26/2015)	None

Data Processing & Analysis

ActiLife's robust data processing toolkit allows users to clean and score actigraphy data using a comprehensive selection of independently developed and validated algorithms. Multiple datasets can be batch processed and exported into a single consolidated CSV or Excel® report.

- > Wear time screening
- > Activity bout detection
- > Inclinometer graphing
- > Group initializations
- > Sedentary analysis
- > GPS file correlation
- > Cut point & MVPA analysis
- > Proximity analysis
- > Clinical reports
- > Energy expenditure
- > Basic sleep scoring
- > CentrePoint integration



Raw Data Analytics

ActiLife provides tools that allow users to quickly view and extract portions of large, high resolution raw datasets. The ActiLife Feature Extraction tool provides a platform for extracting time and frequency domain feature sets directly from the raw data files, as a method for developing application specific learning or pattern recognition algorithms.



ActiLife Data Vault

ActiLife's integrated Data Vault is a centralized cloud-based repository that provides secure data storage and archiving and enables users to seamlessly share data files across multiple research sites.



ActiLife API

The ActiLife API allows users to develop their own custom applications to automate device deployments and downloads by enabling programmatic control of the software over a standard socket.



ActiLife+Sleep

The optional ActiLife+Sleep feature package expands upon ActiLife's basic sleep scoring to provide these additional advanced analysis and reporting tools:

- Autoscoring of bedtimes
- Custom sleep algorithm tool
- Actogram data charting

REPRESENTATIVE RESEARCH STUDIES

ActiGraph hardware and software solutions have been used in thousands of high profile research studies to capture objective physical activity and sleep/wake information for more than one million research subjects around the world. We have nearly two decades of proven expertise in building scalable solutions to meet the specific data collection, analysis, reporting and management requirements for projects of varying size and scope.



National Health and Nutrition Examination Survey (NHANES)

The National Health and Nutrition Examination Survey (NHANES) is an ongoing program of studies conducted by the National Center for Health Statistics responsible for producing vital health statistics for the United States. ActiGraph devices were used to collect physical activity data from 15,000 subjects in the 2003-2004 and 2005-2006 cycles of the survey. The most recent 2011-2012 cycle was the first to monitor participants for 24 hours a day, resulting in one of the largest samples of combined activity and sleep data ever collected.



Women's Health study

One of the largest and longest-running observational studies of women's health in the U.S., this landmark study conducted by Brigham and Women's Hospital and Harvard Medical School began as a randomized trial of low-dose aspirin and vitamin E for cardiovascular disease and cancer prevention in 40,000 female health professionals aged 45+. An ancillary study examining physical activity is currently underway involving 30,000 women from the original trial, and ActiGraph GT3X+ devices are being used to objectively measure physical activity in study participants.



Raine Study

The Western Australian Pregnancy Cohort (Raine) Study is one of the largest successful prospective cohorts of pregnancy, childhood, adolescence and now early adulthood in the world. Current research on the young adult cohort includes the use of ActiGraph GT3X+ devices to capture activity and sleep measures to provide insight into population health.



NAKO Health Study

The NAKO Health Study is nationwide, long-term study of the German population aiming to explain the causes and identify risk factors for chronic diseases. In this study, 200,000 people aged 20-69 years from across Germany receive medical exams, submit blood samples, and undergo lifestyle assessments, including objective activity measurement with ActiGraph devices.



PROactive COPD Project

PROactive is a European project aimed to developing new tools that will enable patients, doctors and researchers to accurately assess the improvement or deterioration of Chronic Obstructive Pulmonary Disease (COPD). After an intensive selection process, ActiGraph devices were used in conjunction with ePRO tools to obtain a comprehensive physical activity overview in 250 COPD patients enrolled in the study.



Transdisciplinary Research on Energetics and Cancer (TREC)

Established by the National Cancer Institute (NCI) in 2005, the Transdisciplinary Research on Energetics and Cancer (TREC) initiative is a major scientific research effort aimed at reducing cancer linked with obesity, poor diet, and low levels of physical activity. ActiGraph devices are used extensively to capture objective information about physical activity and sleep behavior in adults and children in numerous studies under the TREC initiative.



Lifestyle Interventions and Independence for Elders Study (LIFE)

The Lifestyle interventions and Independence for Elders Study phase 3, multi-center randomized controlled trial assesses the long terms effects of physical activity interventions on mobility in a sample of over 1600 sedentary senior adults. ActiGraph devices were used to objectively measure physical activity in study participants across 8 sites in the United States.



The Environmental Determinants of Diabetes in the Young Study (TEDDY)

The aim of the TEDDY study is to identify the causes of type 1 diabetes mellitus through the investigation of environmental and genetic triggers that cause high risk children to develop diabetes. A consortium of six Clinical Centers throughout the U.S. and Europe has been created to develop and carry out studies on a proposed sample of 7800 neonates with a predetermined type 1 diabetes risk.

ACTIGRAPH SCIENTIFIC ADVISORY BOARD

Established in January of 2011, the ActiGraph Scientific Advisory Board is composed of world renowned researchers and scientists from disciplines including metabolic research, exercise physiology, and behavioral medicine. The primary objective of the Scientific Advisory Board is to provide the company with expertise and guidance as it continues to enhance its current hardware and software portfolio and explores emerging applications for ActiGraph products.



David R. Bassett, PhD

David Bassett is a professor in the Department of Kinesiology, Recreation, & Sport Studies at the University of Tennessee, Knoxville. His primary research interest is in the objective measurement of physical activity and energy expenditure in humans. He and his colleagues have studied the validity and reliability of accelerometers, pedometers, and heart rate monitors, and they have developed new methods of assessing physical activity. Dr. Bassett has explored relationships between physical activity and body weight, blood pressure, and other cardiovascular risk factors. He collaborates with researchers in the fields of public health and transportation planning to study the relationships between active transportation and health. Dr. Bassett is a fellow in the American College of Sports Medicine, a member of the National Academy of Kinesiology, and he serves on the editorial boards of *Journal of Applied Physiology*, *Journal of Physical Activity and Public Health*, and *Research Digest*.



Victor KR Matsudo, MD, PhD

Dr. Matsudo is the Scientific Director and Past-President of the Physical Fitness Research Center of São Caetano do Sul (CELAFISCS) and an Invited Professor at Santa Casa Medical School in São Paulo. He is the founder of the Agita Mundo Network, an international organization dedicated to the promotion of physical activity, and the Chairman of the Agita São Paulo Program, organized by the State Secretariat of Health of São Paulo State. He is a founding member and Chairman of the Physical Activity Network of the Americas (RAFA/PANA) and a founding member of the International Society of Physical Activity and Health (ISPAH). Among the awards he has received are the Philip Noel Baker Award, the American College of Sports Medicine (ACSM) Citation Award in 2014 and the ACSM Odyssey Award 2015. Dr. Matsudo has authored two books, 8 book chapters and numerous research publications in the fields of physical activity and sports science.



Jorge Mota, PhD

Dr. Mota is Director of Research Centre in Physical Activity, Health and Leisure at the University of Porto and Faculty's President of General Assembly. A visiting Professor at several Brazilian institutions, Dr. Mota is involved in physical activity promotion networks including HEPA Europe and IPEN. His primary area of work is in issues relating to physical activity, its health related effects, and specifically its relationship with non-communicable diseases. Dr. Mota is also involved in the development and implementation of programmes related to physical activity and health promotion, and he has authored numerous peer reviewed publications.



Bonnie Spring, PhD

Dr. Spring is an expert in developing and evaluating technology-supported interventions to promote improvement in weight management, diet, physical activity, and smoking cessation. She is a clinical health psychologist, Professor of Preventive Medicine, Psychology, Psychiatry, and Public Health and Director of the Center for Behavior and Health at Northwestern University. A Past President of the Society of Behavioral Medicine and Chairperson of the American Psychological Association's Board of Scientific Affairs, she is a winner of The Obesity Society's eHealth Pioneer Award and the Society of Behavioral Medicine's Research to Practice Translation and Distinguished Research Mentor Awards. She was founding editor and editor in chief of *Translational Behavioral Medicine: Practice, Policy, Research*. Her research on fostering healthy lifestyle change in multiple health behaviors has been funded continuously since 1976 primarily by grants from the National Institutes of Health.



Stewart G. Trost, PhD

Stewart Trost is a Professor of Child Health in the School of Exercise and Nutrition Sciences, and member of the Institute of Health and Biomedical Research (IHBI) at Queensland University of Technology (QUT). Trost joined QUT 2014 as an invited research capacity building Chair and currently leads the Children's Physical Activity Research Group at newly constructed Queensland Centre of Children's Health Research. He has been conducting research on obesity-related behaviours in children and adolescents for over 20 years. Stewart has served as a consultant on matters related to measurement of physical activity and obesity prevention to many domestic and international research and public health organizations including the Department of Health and Ageing, National Institutes of Health, Robert Wood Johnson Foundation, and U.S. Centers for Disease Control and Prevention.





ActiGraph Mission

Our mission is to provide leading pharmaceutical, research, and healthcare organizations with innovative activity and sleep monitoring hardware, software, and data analytics and management solutions to improve study efficiency, data quality, and patient outcomes.

ActiGraphCorp.com

49 East Chase Street, Pensacola, FL 32502
sales@actigraphcorp.com | 850.332.7900



©2019 ActiGraph, LLC. All rights reserved.

U.S. federal law restricts this device to sale by or on the order of a physician.