



GT1M Technical Information

The GT1M ActiGraph collects and records physical activity data. ActiGraph, LLC is unaware of any hazard posed by the device during proper operation. Since the GT1M is a combination of many different electronic and mechanical parts, if it is disassembled or broken, there could be smaller pieces dislodged.

› Detailed Breakdown

The outside case is made of polycarbonate plastic material. There is no access to internal parts without removal of four screws located on the back of the ActiGraph and through the access port to the USB connector.

The battery is a single cell prismatic Lithium Ion or Lithium Polymer (3.7 V).

The Printer Circuit Board assembly is made up of various electronic components:

PCB – (FR-4), & Tin Plated Surface Solder Mask

Components – SOIC, Surface Mount Caps & Resistors

The Components are attached with lead free solder (Sn96.5/Ag3/Cu.5).

An O-Ring is used to seal the enclosure.

The O-Ring and USB Boot are manufactured with Neoprene.

The ActiGraph cover is fastened with four #0-1/4" sheet metal screws.

Operating Temperature is -20°C to 60°C (-15°F to 125°F).

Charging and Storage Temperature is 0°C to 40°C (32°F to 100°F).



 Lead Free
Environmentally Friendly

› Manufactured Standard

The GT1M is manufactured according to the standards set forth in IPC-610 Revision "D", Class II. Each device is the put through an Initial test procedure that includes: visual inspection, battery installation, current draw, memory test, push button test, and accelerometer calibration.

› Regulatory Standards

ActiGraph, LLC declares that:

USA: This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

Canada: This Class B digital apparatus complies with Canadian ICES-003.

Europe: Equipment Human Activity Monitor; Model Number GT1M; In accordance with the following directives: 89/336/EEC The Electromagnetic Compatibility Directive and it's amending directives has been designed and manufactured to the following specifications as established in harmonized standards: EN 61000-3-2/3-3, EN 55022: 1994 (A1+A2), and EN 55024.

› RoHS:

As of December 1, 2005, the GT1M meets all minimum standards of the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003.

› Measurements

The GT1M activity monitor accurately and consistently measures and records time varying accelerations ranging in magnitude from approximately 0.05 to 2 G's. The acceleration signal, represented by an analog voltage, is sampled and digitized by a twelve-bit (12) Analog to Digital Converter (ADC) at a rate of thirty times per second (30 Hertz). Once digitized, the signal passes through a digital filter that band-limits the accelerometer to the frequency range of 0.25 to 2.5 Hz. This frequency range has been carefully chosen to detect normal human motion and to reject motion from other sources. The digital filter yields an output signal that responds linearly to changing accelerations within the pass band. Each sample is summed over a user specified interval of time called an 'epoch'.

› Hardware

The primary hardware components of the GT1M include a 16-bit microcontroller with on chip 12 bit ADC, 1 Megabyte (MEG) of NON VOLATILE FLASH memory, a solid-state accelerometer, voltage regulator, and a battery charger. A rechargeable 3.7V single prismatic cell Lithium Ion/Lithium Polymer battery supplies power. Battery life, defined as the time between battery charges, is in excess of fourteen days. Communication and data download between the GT1M and a Microsoft Compatible PC is via a standard USB 2.0 interface. This connection also serves as the battery charger.

› Dimensions

The GT1M is compact with a weight of 27 grams and dimensions of 1.5" x 1.44" x 0.70" (3.8 x 3.7 x 1.8 cm). Depending upon the field of study, the ActiGraph can be worn on the waist for physical activity measures such as activity counts, step counts, calories, activity levels, etc or on the wrist for sleep outcome measures, such as sleep/wake, sleep latency, and sleep efficiency.

› Data Collection

Epochs are user programmable and can range from 30 times per second to several minutes. When using a one-minute epoch, the GT1M can collect 356 (178 if pedometer mode is active) consecutive days of data. At the end of each epoch, the summed value is stored in memory and the numerical integrator is reset. This process repeats until memory is filled at which point the ActiGraph stops collecting data for that session and waits for the data to be downloaded or to be reinitialized. The data collected by the ActiGraph is a series of numbers representing the level or intensity of movement for each epoch. The first number in the data series represents the activity measured for the first epoch, which starts at the user specified start time and date. The numbers that follow in the series represent activity over each epoch in chronological order.