



Actiwatch 2



Actiwatch Spectrum

NOW IT'S TWICE AS EASY TO IMPLEMENT ACTIGRAPHY.

Our new Actiwatch 2 and Actiwatch Spectrum ambulatory devices **solve the complaints** of actigraphy being too hard to use, the devices too uncomfortable to wear and the data acquisition and analysis functions too complex and time consuming. The Actiwatch 2 incorporates a **state-of-the-art ergonomic design**, interchangeable watch bands, an ambient light sensor, and communication and software upgrades such as an automated rest algorithm. The Actiwatch Spectrum includes these features and a real watch face, off-wrist detection, color light recording and other **advanced features**. Now it's more efficient than ever for you to set up the system, gain user compliance and reliably collect and download sleep/wake data. That means it's now easier than ever for you to **monitor a variety of patients** with a variety of sleep complaints.



ACTIGRAPHY MADE EASY

The Actiwatch 2 and Actiwatch Spectrum actigraphy systems combine improved aesthetics with advanced functionality to meet your needs.

Both devices incorporate high-quality biocompatible materials and well-engineered sensors (accelerometer, light, off wrist) to provide 24/7 wearability and accurate data collection. They have been thoroughly tested to be resistant to shock and environmental conditions such as being dropped, cold, heat, dust, sweat and water. Because of the unique strap material, both devices provide “wear it and forget it” comfort. Rugged durability helps enable the collection of complete data without any lapses.

The Actiwatch 2 and Actiwatch Spectrum can be used to analyze circadian rhythms, automatically collect and score data for sleep parameters and assess activity in any instance where quantifiable analysis of physical motion is desired.

Five Modes

Both Actiwatch devices have five operational modes to help ensure battery efficiency and extend battery life.

1. Sleep
2. Standby
3. Data Collection
4. Post Collection
5. Communication

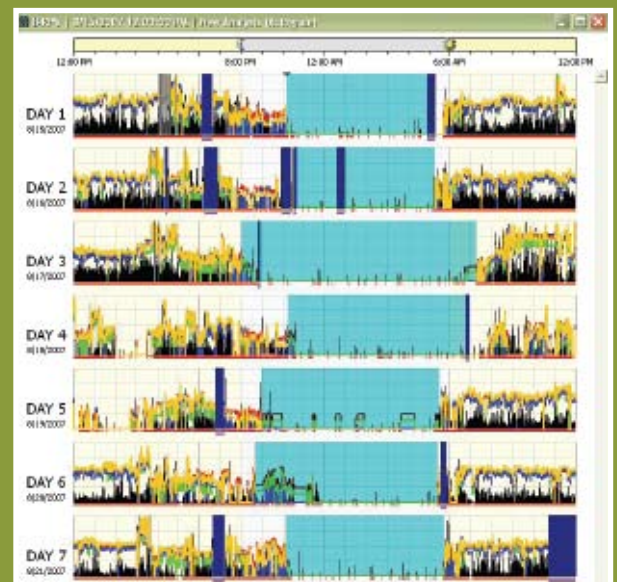


ACTIWARE 5.50 SOFTWARE

Actiware 5.50 software helps make analyzing actigraphy data even easier than before. Features include:

- Automatic rest algorithm
- Minor rest interval detection
- Charts up to seven channels of data on one actogram
- Supports legacy Actiwatch devices and ActiReaders
- Simultaneous data downloading from multiple devices
- Easy to set user defaults for common functions
- Automatic tabulation of sleep statistics for user-defined intervals
- Easy-to-use prompts for installation and communication to the Actiwatch devices
- Detailed how-to-use software tutorial website: www.learnactiware.com
- 21 CFR Part 11 compliant

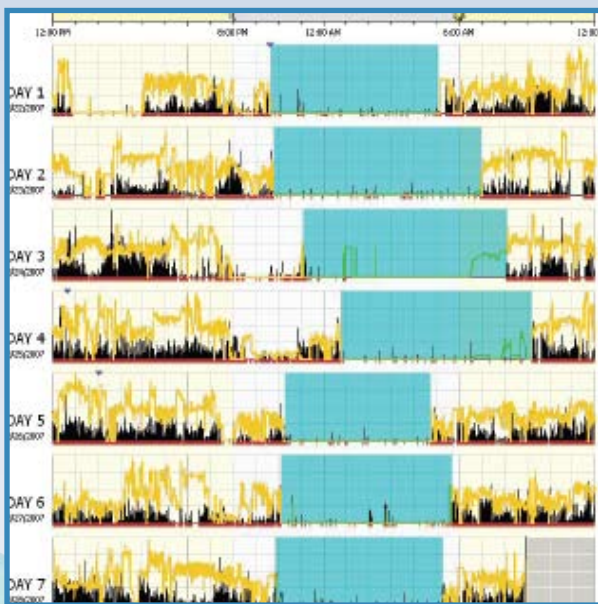
Wake/activity intervals are shown in black, sleep intervals in aqua, off wrist intervals in dark blue, event marks in dark blue triangles and light data in red, green, blue and yellow.



ACTIWATCH 2 SPECIAL FEATURES:

- Small, sleek and comfortable design to help enhance patient comfort and increase patient compliance
- Large memory (1 MBit)
- Three Data Channels: Photopic white light illuminance, activity, and event marking
- Ultrasonic welded case designed to provide moisture protection and increased resistance to environmental challenges (moisture, shock, dust, etc.)
- Faster communications rate
- Rechargeable battery – via USB or wall current with 30-day life
- Can be used with a hospital band
- Light sensing – records information about the amount and duration of ambient white light illuminance in units of lux
- Extra bands included with system

Wake/activity intervals are shown in black, sleep intervals in aqua, event marks in dark blue triangles and light data in yellow.

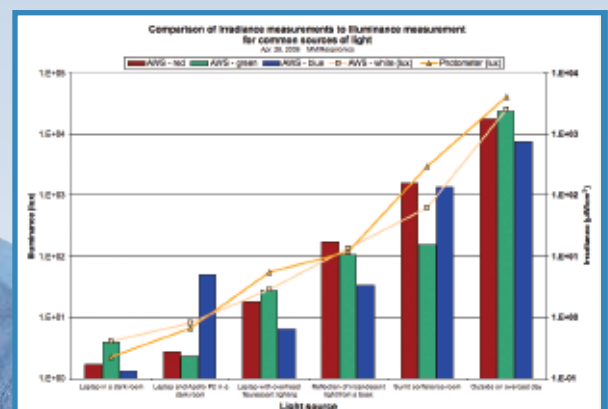


**Patient Rental
Service Available**

ACTIWATCH SPECTRUM SPECIAL FEATURES:

- Comfortable, aesthetic design to help enhance patient comfort and increase patient compliance
- Off-wrist detector with real-time feedback on display
- Time and date indicators (like an actual wristwatch)
- Device status indicator (e.g., logging, not logging, on wrist, off wrist, successful marker push)
- Seven Data Channels: white photopic light illuminance, red, green and blue light irradiance, activity, off-wrist and event marking
- Designed to provide moisture protection and increased resistance to environmental challenges (moisture, shock, dust, etc.)
- Backlit display
- Infrared communication to the dock
- One-year battery life – changeable at factory
- Large memory (2 MBit Non-volatile)
- Faster communications and data-download rate
- White light illuminance in units of lux
- Color light recording – irradiance, in units of microwatts/cm², and photon flux, in units of photons/cm²/sec, in three color bands of the visual spectrum: red, green and blue
- Extra bands included with system

The free-living white light illuminance measurement performance as compared to a photometer is depicted, along with varying intensities of colored light irradiance measurements across common sources of light.



Actiwatch 2

PARAMETER	TYPICAL VALUE
Size	43mm x 23mm x 10mm
Weight	16 grams (with band)
Case Material	ABS Blend (Biocompatible)
Standard Wrist Band	BASF Elastollan 1175A10W (TPU) with titanium buckle – accommodates 7mm hospital type band
Battery Type	Lithium cell (rechargeable at dock)
Battery Charge Time	6 hours from empty to full
Logger Battery Life	30 days at 1-minute epoch lengths
Memory	Non-volatile 1 MBits

LOGGING INTERVAL

Epoch Length	Epochs per day	Logging time (activity only)	Logging time (activity and light)
15 seconds	5760	22.7 days	7.5 days
30 seconds	2880	45.5 days†	15.1 days
1 minute	1440	91 days†	30.3 days

† Actual recording time limited by battery life of 30 days typical before recharging is required.

Note: Device also records in 2-minute and 5-minute epoch lengths and in a light-only mode.

ACCELEROMETER DETAILS

Type	Solid-state "Piezo-electric" accelerometer
Range	0.5 – 2 G peak value
Bandwidth	0.35 – 7.5 Hz typical
Sensitivity	0.025 G (at 2 count level)
Sampling Rate	32 Hz

LIGHT SENSOR DETAILS

Type	Silicon photodiode
Wavelength Range	400 – 900 nanometers
Wavelength Peak Sensitivity	570 nanometers
Measurement Units	Photopic illuminance in Lumens/m ² (Lux)
Illuminance Range	5 – 100,000 Lux
Accuracy	10% at 3000 Lux (typical)

ENVIRONMENTAL ATTRIBUTES

Moisture Protection	Waterproof 1m for 30 min per IPX7 IEC 60529
Operating Temperature Range	5°C to 40°C
Resistance	Resists dust, water, heat, perspiration

COMPUTER & COMMUNICATION DOCK ATTRIBUTES

Hardware Platform Personal Computer	Pentium II or later
Operating System Compatibility	Actiware: Windows 2000, Windows XP or Windows Vista; Actiware CT: Windows 2000, Windows XP Professional, Windows Vista Business or Windows Vista Ultimate
USB Compatibility	Version 1.1 and 2.0 full speed
Data Communication Rates	57.6 kbps
Dock Functions	Battery charge, device configuration and data retrieval
Charge Mode	USB connection or wall current



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Actiwatch Spectrum

PARAMETER	TYPICAL VALUE
Size	48mm x 37mm x 14mm
Weight	30 grams (with band)
Case Material	ABS Blend (Biocompatible)
Standard Wrist Band	BASF Elastollan 1175A10W (TPU) with titanium buckle
Battery Type	CR 2430 Lithium Coin Cell (factory replaced)
Logger Battery Life	1 year with continuous use
Memory	Non-Volatile 2 MBits

LOGGING INTERVAL

Epoch Length	Epochs per day	Logging time (activity only)	Logging time (activity and RGB light)
15 seconds	5760	45.5 days	9 days
30 seconds	2880	91 days	18 days
1 minute	1440	182 days	36 days

Note: Device also records in 2-minute and 5-minute epoch lengths, in photopic light-only mode, and in an RGB light-only mode.

ACCELEROMETER DETAILS

Type	Solid-state "Piezo-electric" accelerometer
Range	0.5 – 2 G peak value
Bandwidth	0.35 – 7.5 Hz typical
Sensitivity	0.025 G (at 2 count level)
Sampling Rate	32 Hz

LIGHT SENSOR DETAILS

Type	Color sensitive photodiodes
Wavelength Range	400 – 700 nanometers
Measurement Units	Irradiance (microwatts/cm ²); Photon flux (photons/cm ² /sec); Photopic illuminance (Lux)
Irradiance Range	0.1 – 5500 microwatts/cm ²
Accuracy	10% at 1500 Lux (typical)

OFF WRIST DETECTOR

Sensor	Capacitive
On-Wrist Activation Range	<2mm

ENVIRONMENTAL ATTRIBUTES

Moisture Protection	Waterproof 1m for 30 min per IPX7 IEC 60529
Operating Temperature Range	5°C to 40°C
Resistance	Resists dust, water, heat, perspiration

COMPUTER & COMMUNICATION DOCK ATTRIBUTES

Hardware Platform Personal Computer	Pentium II or later
Operating System Compatibility	Actiware: Windows 2000, Windows XP or Windows Vista; Actiware CT: Windows 2000, Windows XP Professional, Windows Vista Business or Windows Vista Ultimate
Communication Interface	USB to infrared connection
USB Compatibility	Version 1.1 and 2.0 full speed
Data Communication Rates	57.6 kbps



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