MOVESENSE MEDICAL SENSOR

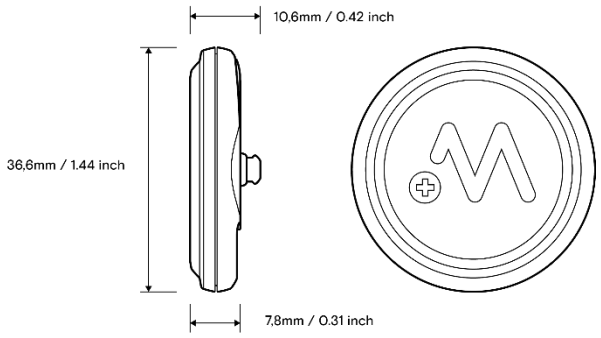
Movesense MD is a wireless programmable sensor, used an ECG and movement signal measurement device to provide data for medical applications and host devices for analysis. The Movesense MD is capable of measuring and sending processed derivatives of the measurement data wirelessly to smartphones via Bluetooth LE. Open APIs enable the development of unique in-device apps to tailor the sensor functionality to the exact needs of each specific use case.

- Clinical grade single channel ECG measurement
- Clinical grade movement measurement
- Swim and shock proof construction, suitable for daily use and independent operation by patients
- User replaceable coin cell battery
- State of the art ultra-low power components
- Based on Suunto design and development
- Developed, designed and manufactured in Finland in accordance with the ISO 13485 quality system
- Available with custom branding

TECHNICAL HIGHLIGHTS

- Heart rate, R-R intervals, BLE heart rate service and single channel ECG
- 9-axis movement sensor: acceleration, gyroscope, magnetometer
- Non-medical internal temperature
- Data logging memory
- Bluetooth Low Energy radio
- Tools for developing customized applications that run inside the sensor
- Software libraries for developing compatible mobile applications
- Wireless firmware update capability
- Class IIa Medical Device Accessory, EU medical device directive 93/42/EEC

TECHNICAL BRIEF



DIMENSIONS

- 36.6mm/1.44” dia. x 10.6mm/0.42” thick
- Weight 9,4g / 0.33oz with battery
- Water resistant to 30m/100ft

I/O

- Red led on the front, SW controllable
- Interface via Movesense studs, stud center-to-center Distance: 27.0mm/1.06”

SENSORS

- Acceleration (16 bit output resolution)
  - ±2/±4/±8/±16g, output unit: m/s2, accuracy: ±2%
  - 12.5/26/52/104/208Hz sampling frequency
- Gyroscope (16 bit output resolution)
  - ±125/±245/±500/±1000/±2000°/s, output unit: °/s, accuracy: ±2%
  - 12.5/26/52/104/208Hz sampling frequency
- Single channel ECG waveform
  - Sampling frequency: 128/256/512Hz
  - Measurement bandwidth: 0.5Hz-40Hz as defined in IEC 60601-2-47
  - Dynamic range 60mVp-p, max offset: 500mV, resolution: 15 bits
  - Heart rate: 20BPM-240BPM, resolution: 1BPM, accuracy: ±1BPM
  - R-R intervals: 200ms-2000ms, resolution: 1ms, timing accuracy: ±1ms
- Magnetic field
  - ±49 gauss, 1.5±10% mgauss /LSB, output unit: mgauss
- Non-medical, device internal temperature
  - Accuracy <±0.5°C, 0°C to +65°C

LOGGER MEMORY

- 3Mbit EEPROM

SOFTWARE

- SDK for developing apps for the sensor
- Sensors and peripherals controllable via API incl. BT advertising, power schemes
- Easy to use C++ Movesense Device API
- iOS and Android mobile libraries with wireless sensor firmware update capability
- GNU toolchain for embedded ARM

MCU

- Nordic Semiconductor nRF52832
- 32 –bit ARM® Cortex®-M4
- 64kB on-chip RAM*
- 512kB on-chip FLASH*

  (*) Memory is shared with the Movesense OS and the user application
- Bluetooth Low Energy radio

BATTERY

- CR 2025 Lithium coin cell battery

APPROVALS AND COMPLIANCES

- CE, FCC, IC, C-Tick, CMIIT
- Conforms REACH, RoHS
- Bluetooth Low Energy radio

PATENTS

US 13/071,624, US 13/832,049, US 13/832,598, US 13/917,668, US 13/397,872, USD 667,127, US 8,386,009, US 8,750,959, US 8,814,574, US 8,886,281, others pending