

MOVESENSE FLASH SENSOR

ECG, heart rate and movement sensor with a 128MB on-board memory for stand-alone data recording. Versatile, light, and compact but extremely durable sensor capable of recording accurate single-channel ECG, heart rate intervals, and raw movement data for post-analysis without a continuous connection to a mobile phone.



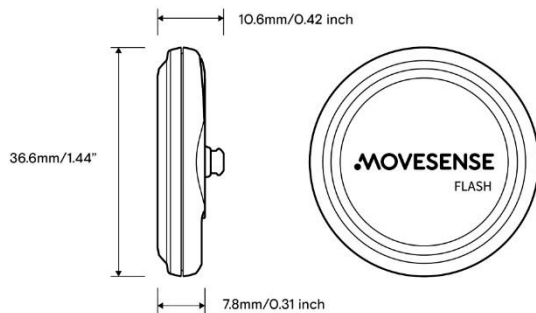
- 128MB of on-board storage capacity - up to 67h of ECG recording *
- Small, lightweight, and unobtrusive during long, continuous data recording
- Data security in situations where Bluetooth transmission is inconvenient or undesirable
- Water- and shock-resistant for all kinds of activities and operating environments – even underwater
- Practical accessories for wearing the sensor on different parts of the body
- Developed, designed, and manufactured in Finland
- Available with custom branding and firmware

TECHNICAL HIGHLIGHTS

- Single-channel ECG, heart rate and heart rate intervals
- 9-axis motion sensor: acceleration, gyroscope, magnetometer
- Bluetooth® 5.1
- Standard Bluetooth LE heart rate service for connecting with a smart watch or other compatible host
- Edge computing: Open APIs, sample code, and developer tools for firmware customization
- Software libraries for developing compatible mobile applications
- Wireless firmware update capability

* With firmware 2.1.5. Read Application Note for further details.

TECHNICAL BRIEF



DIMENSIONS

- $\varnothing$ 36.6mm/1.44" x 10.6mm/0.42"
- Weight 9.4g / 0.34oz with battery
- Water resistant to 30m/100ft

I/O

- Red LED on the front, SW controllable
- Wake-up: heart rate and movement
- Interface via Movesense studs, stud center-to-center distance: 27.0mm/1.06"

SENSORS

- Acceleration & Gyroscope
 - $\pm 2/\pm 4/\pm 8/\pm 16g$ full scale
 - $\pm 125/\pm 245/\pm 500/\pm 1000/\pm 2000^\circ/s$ full scale, sample rates 12.5/26/52/104/208/416/833Hz
- Magnetometer ± 49 gauss full scale
- Heart rate, beats/minute, RR intervals (1ms resolution), standard BLE HR service
- Single channel ECG, bandwidth 0.5-40Hz, sample rates 125/128/200/250/256 (500/512Hz available, but not recommended for raw storage)

DATA LOGGING MEMORY

- Integrated 128MB (1Gb) FLASH.
Note: certain limitations apply to data logging at high memory fill rates and fast data rates. Further details in Application Note.
- Verified download speed up to 78kB/sec (depends on the receiving mobile device)

SOFTWARE

- SDK for developing apps for the sensor
- Sensors and peripherals controllable via API, incl. Bluetooth advertising and 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 shared between the Movesense Os and the user application

- Bluetooth® 5.1

BATTERY

- CR 2025 Lithium coin cell battery, user replaceable
- Examples of estimated battery life (FW 2.1.5):
ECG@125Hz: ~300h
ECG@256Hz: ~200h (6 full recording-download cycles)
3-axis acceleration@26Hz: ~3 weeks (3 recording-download cycles)

APPROVALS AND COMPLIANCES

- CE, Others coming
- Conforms to REACH, RoHS
- Bluetooth

PATENTS

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