

# MOVESENSE SENSOR



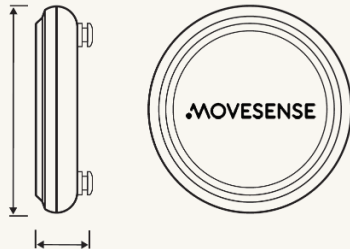
Versatile, programmable, light and small but extremely durable Bluetooth LE equipped sensor capable of measuring any movement and much more. Customizable functionality through open APIs that enable development of unique in-device apps. The functionality can be tailored to fit the exact needs of the target use case.

- Swim and shock proof construction, suitable for any sports
- Low profile snap connection for smooth and subtle attachment to apparel or gear
- User replaceable coin cell battery, state of the art ultra-low power components
- Small size, light weight and water proof
- Based on Suunto design and development
- Developed, designed and manufactured in Finland
- Can run customer firmware; example codes and tools provided to help development
- Available with custom branding

## Technical highlights

- 9-axis motion sensor: acceleration, gyroscope, magnetometer
- Heart rate, R-R- intervals, BLE heart rate service, optional: single channel ECG
- 1-wire expansion bus
- Temperature
- Data logging memory
- Bluetooth® 4.x radio (FW v2.0: Bluetooth 5.0 support for enhanced data rate)
- Tools for developing customized applications that run inside the sensor
- Software libraries for developing compatible mobile applications
- Wireless firmware update capability
- Can recognize its attachment base through a unique ID in the MoveSense Smart Connector

# Movesense Sensor Technical Brief



## Dimensions

- ✓ 36.5 mm/1.44" dia. x 8 mm/0.32" thick
- ✓ Weight 9.4 g / 0.33 oz with battery
- ✓ Water resistant to 30m/100ft

## Sensors

- ✓ Acceleration & Gyroscope
  - $\pm 2/\pm 4/\pm 8/\pm 16$ g full scale
  - $\pm 125/\pm 245/\pm 500/\pm 1000/\pm 2000^\circ/s$  full scale, sampling frequency: 13/26/52/104/... /1666 Hz
- ✓ Magnetometer
  - $\pm 4/\pm 8/\pm 12/\pm 16$  gauss full scale
- ✓ Temperature
  - accuracy  $<\pm 0.5^\circ\text{C}$ ,  $0^\circ\text{C}$  to  $+65^\circ\text{C}$
- ✓ Heart rate, RR intervals, BLE HR service
  - Optional: non-medical 1 Ch ECG\*  
(\* ) See Movesense Medical variant for a medically approved version

## MCU

- ✓ Nordic Semiconductor nRF52832
  - 32-bit ARM<sup>®</sup> Cortex<sup>®</sup>-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
- ✓ Operating time up to months, depending on the user application

## I/O

- ✓ Red led on the front, SW controllable
- ✓ Wake-up, heart rate and 1-wire expansion interface via Movesense studs, stud center-to-center distance: 27.0mm/1.06"
- ✓ Optional Smart Attachments with unique ID

## 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

## Approvals and compliances

- ✓ CE, FCC, IC, C-Tick, CMIIT
- ✓ Conforms REACH, RoHS
- ✓ Bluetooth 4.x, upgradable to 5.0

## 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