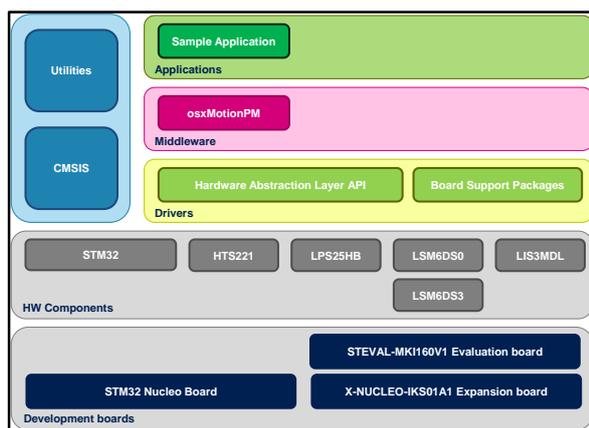


## Real-time Pedometer software expansion for STM32Cube

Data brief



### Description

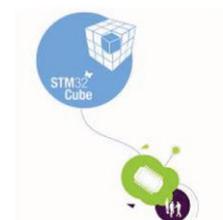
osxMotionPM is an add-on software package for X-CUBE-MEMS1. The software runs on the STM32 and includes drivers that recognize the inertial sensors (LSM6DS0 or LSM6DS3).

It provides real-time information on number of steps and cadence.

The algorithm exclusively manages the data acquired from the accelerometer at 50 Hz sampling frequency to minimize the power consumption of the hosting platform. The software comes with sample implementations of such drivers, exploiting the STM32Cube software technology, running on an X-NUCLEO-IKS01A1 (with optional STEVAL-MK1160V1 board), on top of a NUCLEO-F401RE or NUCLEO-L476RG board.

### Features

- Real-time step counter algorithm (under OpenSoftwareX license) based only on accelerometer data.
- Complete middleware to build applications on top of X-CUBE-MEMS1.
- Easy portability across different MCU families, thanks to STM32Cube.
- Sample application to transmit real-time sensor and pedometer data to a PC.
- Sample implementation on X-NUCLEO-IKS01A1 board (with optional STEVAL-MK1160V1 board), on top of a NUCLEO-F401RE or NUCLEO-L476RG board.



### What is STM32Cube?

STM32Cube™ represents the STMicroelectronics initiative to make developers' lives easier by reducing development effort, time and cost. STM32Cube covers the STM32 portfolio.

STM32Cube version 1.x includes:

- STM32CubeMX, a graphical software configuration tool that allows the generation of C initialization code using graphical wizards.
- A comprehensive embedded software platform specific to each series (such as the STM32CubeF4 for the STM32F4 series), which includes:
  - the STM32Cube HAL embedded abstraction-layer software, ensuring maximized portability across the STM32 portfolio
  - a consistent set of middleware components such as RTOS, USB, TCP/IP and graphics
  - all embedded software utilities with a full set of examples

### How does this software complement STM32Cube?

The software is based on the STM32CubeHAL hardware abstraction layer for the STM32 microcontroller. osxMotionPM is an add-on software package for X-CUBE-MEMS1, which extends STM32Cube by providing a board support package (BSP) for the sensors expansion board and some middleware components for serial communication with a PC.

The osxMotionPM real-time software acquires data from the accelerometer and counts the number of steps together with cadence.

The software can be also joined with other human motion recognition algorithms to significantly improve user experience in advanced motion-based applications in the consumer, computer, industrial and medical fields.

As the step detection software is designed for mobile and wearable applications, the exclusive use of the accelerometer in osxMotionPM facilitates the implementation of low power consumption strategies for these applications.

The osxMotionPM package includes a sample application that developers can use to experiment with the code in two modes of operation:

- standalone mode, where the detected steps and range of cadence (low, medium and high) are stored in the MCU internal Flash memory
- GUI mode, where the acquired sensor data, the number of steps and cadence are returned in real-time via the application GUI.

## Revision history

Table 1: Document revision history

Date	Version	Changes
14-Jun-2016	1	Initial release.
04-Aug-2016	2	Updated cover page features and description.

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