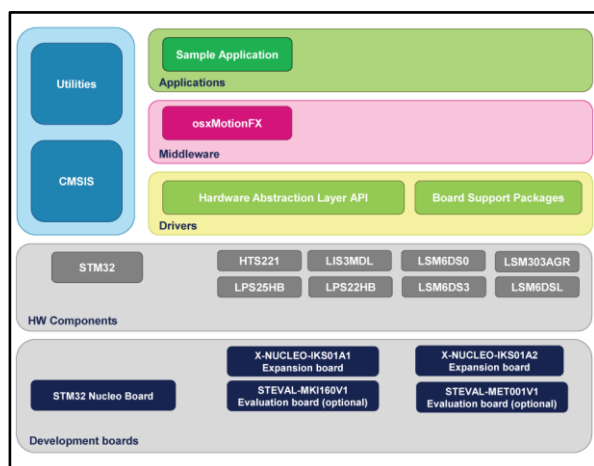


Real-time motion-sensor data fusion software expansion for STM32Cube

Data brief

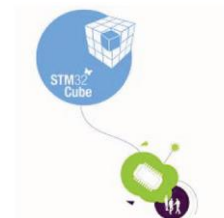


Description

osxMotionFX is an add-on software package for X-CUBE-MEMS1. The software runs on the STM32 and includes drivers that recognize the sensors and provide real-time motion-sensor data fusion. The add-on is built on STM32Cube software technology to ease portability across different STM32 microcontrollers. The software comes with examples of implementation of the drivers running on the X-NUCLEO-IKS01A1 or X-NUCLEO-IKS01A2, when connected to a NUCLEO-F401RE or NUCLEO-L476RG.

Features

- osxMotionFX (iNEMOEngine PRO) real-time motion-sensor data fusion (under OPEN.MEMS license)
- Complete software to build applications using temperature and humidity sensor (HTS221 for both X-NUCLEO-IKS01A1 and X-NUCLEO-IKS01A2), pressure sensor (LPS25HB for X-NUCLEO-IKS01A1 and LPS22HB for X-NUCLEO-IKS01A2) and motion sensors (LIS3MDL and LSM6DS0 for X-NUCLEO-IKS01A1 and LSM303AGR and LSM6DSL for X-NUCLEO-IKS01A2)
- Gyroscope bias and magnetometer calibration routine
- Easy portability across different MCU families, thanks to STM32Cube
- Sample application to transmit real-time both sensor data and sensor fusion data to a PC
- Sample implementation available on board X-NUCLEO-IKS01A1 or X-NUCLEO-IKS01A2 when connected to NUCLEO-F401RE or NUCLEO-L476RG



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 STM32Cube for the STM32 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 and X-CUBE-MEMS1?

This software is based on the STM32CubeHAL hardware abstraction layer for the STM32 microcontroller. osxMotionFX is an add-on software package for X-CUBE-MEMS1. X-CUBE-MEMS1 extends STM32Cube by providing a board support package (BSP) for the sensor expansion board and middleware components for serial communication with a PC. The osxMotionFX (iNEMOEngine PRO) filtering and predictive software suite uses advanced algorithms to intelligently integrate outputs from multiple motion MEMS sensors, independent of environmental conditions, for optimal performance. Real-time motion-sensor data fusion is set to significantly improve user experience, increasing accuracy, resolution, stability and response time in advanced motion-based applications in consumer, computer, industrial and medical fields. The package also includes a sample application that developers can use to experiment with the code. The sample application was developed to enable sensor data logging and provide motion-sensor fusion results on a PC. With the sensor data log utility, users can choose between various sensors available on the expansion board. Sensor data and sensor fusion data can be logged in a user-selected file.

1 Revision history

Table 1: Document revision history

Date	Revision	Changes
24-Feb-2015	1	First release.
12-Jun-2015	2	Updated: Overall system architecture on the cover page.
19-Oct-2015	3	Updated: Overall system architecture, features and description on the cover page.
21-Dec-2015	4	Updated cover image.
24-Nov-2016	5	Updated cover image , features and description.

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