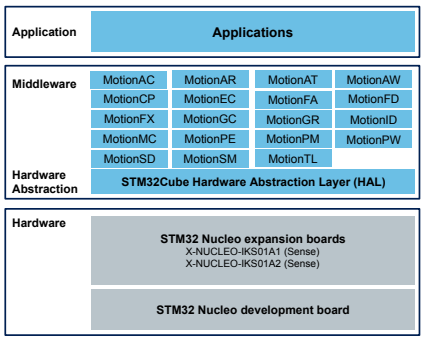
X-CUBE-MEMS1-V4

Data brief

Version 4 legacy sensor and motion algorithm software expansion for STM32Cube



Features

- Complete software to build applications using temperature and humidity sensors (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)
- Several examples to show the innovative inertial and environmental sensors
- Sample application to transmit real-time sensor data to a PC
- Compatible with the Unicleo-GUI graphical user interface to display sensor data and configure outputs
- Sample implementation available on X-NUCLEO-IKS01A1 or X-NUCLEO-IKS01A2 board connected to a NUCLEO-F401RE, NUCLEO-L152RE, NUCLEO-L476RG or NUCLEO-L053R8 development board and SensorTile (STEVAL-STLKT01V1)
- Advanced motion libraries with sample applications available only for NUCLEO-F401RE and NUCLEO-L476RG
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

Description

The X-CUBE-MEMS1-V4 (legacy version) expansion software package for STM32Cube runs on the STM32 and includes drivers that recognize the sensors and collect temperature, humidity, pressure and motion data from the HTS221, LPS25HB, LSM6DS0, LSM6DS3, LPS22HB, LSM6DSL, LSM303AGR and LIS3MDL devices.

The expansion is built on STM32Cube software technology to ease portability across different STM32 microcontrollers.

The software comes with a sample implementation of the drivers running on the X-NUCLEO-IKS01A1 or X-NUCLEO-IKS01A2 expansion boards connected to a NUCLEO-F401RE, NUCLEO-L053R8, NUCLEO-L152RE or NUCLEO-L476RG development board and SensorTile (STEVAL-STLKT01V1).

The software provides advanced motion libraries together with sample applications available only for NUCLEO-F401RE and NUCLEO-L476RG. The motion libraries include MotionAC (accelerometer calibration library), MotionAR (activity recognition library), MotionAW (activity recognition for wrist library), MotionCP (carrying position library), MotionEC (eCompass library), MotionFA (fitness activities library), MotionFD (fall detection library), MotionFX (sensor fusion library), MotionGC (gyroscope calibration library), MotionGR (gesture recognition library), MotionID (intensity detection library), MotionMC (magnetometer calibration library), MotionPE (pose estimation library) and MotionPM (pedometer library), MotionSD (standing and sitting desk detection library), MotionTL (tilt sensing library).

Product summary	
Version 4 legacy sensor and motion algorithm software expansion for STM32Cube	X-CUBE-MEMS1-V4
Sensor and motion algorithm software expansion for STM32Cube	X-CUBE-MEMS1 (current version of the software)
Motion MEMS and environmental sensor expansion board for STM32 Nucleo	X-NUCLEO-IKS01A2
SensorTile development kit	STEVAL-STLKT01V1
STM32 Nucleo development board	STM32 Nucleo

1 Detailed description

1.1 What is STM32Cube?

STM32Cube is a combination of a full set of PC software tools and embedded software blocks running on STM32 microcontrollers and microprocessors:

- STM32CubeMX configuration tool for any STM32 device; it generates initialization C code for Cortex-M cores and the Linux device tree source for Cortex-A cores
- STM32CubeIDE integrated development environment based on open-source solutions like Eclipse or the GNU C/C++ toolchain, including compilation reporting features and advanced debug features
- STM32CubeProgrammer programming tool that provides an easy-to-use and efficient environment for reading, writing and verifying devices and external memories via a wide variety of available communication media (JTAG, SWD, UART, USB DFU, I2C, SPI, CAN, etc.)
- STM32CubeMonitor family of tools (STM32CubeMonRF, STM32CubeMonUCPD, STM32CubeMonPwr) to help developers customize their applications in real-time
- STM32Cube MCU and MPU packages specific to each STM32 series with drivers (HAL, low-layer, etc.), middleware, and lots of example code used in a wide variety of real-world use cases
- STM32Cube expansion packages for application-oriented solutions

1.2 How does this software complement STM32Cube?

This software is based on the STM32CubeHAL hardware abstraction layer for the STM32 microcontroller.

The package extends STM32Cube by providing a board support package (BSP) for the sensor expansion board. The drivers abstract the hardware low-level details and allow the applications to access sensor data in a hardware-independent manner.

The package includes several sample applications that the developer can use to start experimenting with the code. A sample application has been developed to enable sensor data logging on a PC; a Windows PC utility (Unicleo-GUI) is available on www.st.com, to allow the developer choose among various sensors available on the expansion board and set the appropriate delay/interval among consecutive data points.

Sensor data can be logged to a file selected by the user.

The package is compatible with STM32CubeMX. It can be downloaded from and installed directly into STM32CubeMX, as detailed in the in UM1718 (freely available on www.st.com).

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
20-Jul-2018	1	First release.
23-Jul-2019	2	Added SensorTile compatibility information.