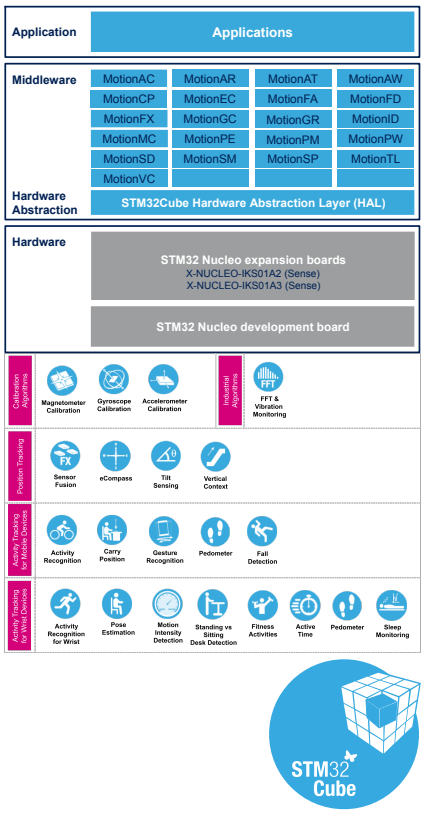
X-CUBE-MEMS1

Data brief

Sensor and motion algorithm software expansion for STM32Cube



Product summary	
Sensor and motion algorithm software expansion for STM32Cube	X-CUBE-MEMS1
Motion MEMS and environmental sensor expansion board for STM32 Nucleo	X-NUCLEO-IKS01A2/ X-NUCLEO-IKS01A3
STM32 Nucleo development board	STM32 Nucleo

Features

- Complete software to build applications using the following sensors:
  - temperature and humidity sensors: HTS221 for X-NUCLEO-IKS01A2 and X-NUCLEO-IKS01A3
  - pressure sensor: LPS22HB for X-NUCLEO-IKS01A2, LPS22HH for X-NUCLEO-IKS01A3 and LPS33HW via DIL24 interface
  - temperature sensor: STTS751 for X-NUCLEO-IKS01A3
  - motion sensors: LSM303AGR and LSM6DSL for X-NUCLEO-IKS01A2, LIS2MDL, LIS2DW12 and LSM6DSO for X-NUCLEO-IKS01A3, and ASM330LHH, IIS2DLPC, IIS2MDC, ISM303DAC, ISM330DLC, LIS2DH12 and LSM6DSOX via DIL24 interface
- 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 the X-NUCLEO-IKS01A2/X-NUCLEO-IKS01A3 boards connected to a NUCLEO-F401RE, NUCLEO-L152RE, NUCLEO-L476RG or NUCLEO-L073RZ development board
- Advanced motion libraries with sample applications
- Package compatible with STM32CubeMX, can be downloaded from and installed directly into STM32CubeMX
- Easy portability across different MCU families, thanks to STM32Cube
- Free, user-friendly license terms

Description

The X-CUBE-MEMS1 expansion software package for STM32Cube runs on the STM32 and includes drivers that recognize the sensors and collect temperature, humidity, pressure and motion data.

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-IKS01A2/X-NUCLEO-IKS01A3 expansion boards connected to a featured STM32 Nucleo development board.

The software provides sample applications and advanced motion libraries (MotionAC, MotionAR, MotionAT, MotionAW, MotionCP, MotionEC, MotionFA, MotionFD, MotionFX, MotionGC, MotionGR, MotionID, MotionMC, MotionPE, MotionPM, MotionPW, MotionSD, MotionSM, MotionSP, MotionTL and MotionVC).

1 Detailed description

1.1 What is STM32Cube?

STMCube™ is an STMicroelectronics initiative that helps you reduce 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

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
07-Nov-2014	1	First release.
19-Dec-2014	2	Modified the document title, features and description text on the cover page. Added Section 1: Detailed description.
17-Jun-2015	3	Updated: Title on the cover page.
20-Oct-2015	4	Updated: Overall system architecture, features and description on the cover page.
21-Dec-2015	5	Updated cover image
22-Dec-2015	6	Updated How does this software complement STM32Cube?
04-Nov-2016	7	Updated cover image Updated hardware compatibility information for X-NUCLEO-IKS01A2 expansion board and associated sensors.
20-Mar-2017	8	Updated cover image, features, description and How does this software complement STM32Cube?
20-Sep-2017	9	Updated cover page image and description.
14-Nov-2017	10	Updated cover page title.
09-Jul-2018	11	Updated cover page image, features and description.
20-Dec-2018	12	Updated cover page features and Section 1.2 How does this software complement STM32Cube?
18-Feb-2019	13	Updated cover page image. Added X-NUCLEO-IKS01A3 expansion board compatibility information.
05-Jun-2019	14	Updated cover page image, features and description.

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