Quick Start Guide

STM32Cube function pack for ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors (FP-SNS-ALLMEMS2)
Quick Start Guide Contents

FP-SNS-ALLMEMS2: STM32Cube function pack for ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors
Hardware and Software overview

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STM32 Open Development Environment: Overview
Sample implementations are available for:

1. **STM32 Nucleo with expansion boards**
   - NUCLEO-F446RE (or NUCLEO-L476RG) + X-NUCLEO-CCA02M1 + X-NUCLEO-IDB05A1 + X-NUCLEO-IKS01A2

2. **STEVAL-STLKT01V1 evaluation boards**
   - STEVAL-STLCS01V1 + STEVAL-STLCR01V1 + STEVAL-STLCX01V1

3. **STEVAL-BCNKT01V1 evaluation boards**
   - STEVAL-BCNCS01V1 + STEVAL-BCNCR01V1 + STEVAL-BCNST01V1

4. **STEVAL-MKSBOX1V1 evaluation boards**
X-NUCLEO-IKS01A2 Hardware Description

• The X-NUCLEO-IKS01A2 is a motion MEMS and environmental sensor evaluation board system.
• It is compatible with the Arduino UNO R3 connector layout, and is designed around ST’s latest sensors.

Key Product on board

**LSM6DSL**
MEMS 3D accelerometer (±2/±4/±8/±16 g) + 3D gyroscope (±125/±245/±500/±1000/±2000 dps)

**LSM303AGR**
MEMS 3D magnetometer (±50 gauss) + MEMS 3D accelerometer (±2/±4/±8/±16 g)

**LPS22HB**
MEMS pressure sensor, 260-1260 hPa absolute digital output barometer

**HTS221**
Capacitive digital relative humidity and temperature

DIL 24-pin
Socket available for additional MEMS adapters and other sensors (UV index)
X-NUCLEO-IKS01A3 Hardware description

- The X-NUCLEO-IKS01A3 is a motion MEMS and environmental sensor evaluation board system.
- It is compatible with the Arduino UNO R3 connector layout, and is designed around ST’s latest sensors.

Key products on board

**LSM6DSO**
MEMS 3D accelerometer (±2/±4/±8/±16 g) + 3D gyroscope (±125/±250/±500/±1000/±2000 dps)

**LIS2DW12**
MEMS 3D accelerometer (±2/±4/±8/±16 g)

**LIS2MDL**
MEMS 3D magnetometer (±50 gauss) +

**LPS22HH**
MEMS pressure sensor, 260-1260 hPa absolute digital output barometer

**HTS221**
Capacitive digital relative humidity and temperature

**STTS751**
Digital Temperature sensor

**DIL 24-pin**
Socket available for additional MEMS adapters and other sensors (UV index)

Latest info available at www.st.com

**X-NUCLEO-IKS01A3**

**Connector for the STM32 Nucleo Board**
X-NUCLEO-IDB05A1 Hardware Description

- The X-NUCLEO-IDB05A1 is a Bluetooth Low Energy (BLE) evaluation and development board system, designed around ST’s SPBTLE-RF Bluetooth Low Energy module based on BlueNRG-MS.

- The BlueNRG-MS processor hosted in the SPBTLE-RF module communicates with the STM32 Nucleo developer board host microcontroller through an SPI link available on the Arduino UNO R3 connector.

Key Products on board

SPBTLE-RF

SPBTLE-RF integrates a BALF-NRG-01D3 balun and a chip antenna. It embeds 32 MHz and 32.768 kHz crystal oscillators for the BlueNRG-MS.

M95640-R
64-Kbit serial SPI bus EEPROM with high-speed clock interface.

Latest info available at www.st.com X-NUCLEO-IDB05A1
X-NUCLEO-CCA02M1 Hardware Description

- The X-NUCLEO-CCA02M1 is a board based on digital MEMS microphones. It has two MP34DT01–M microphones soldered on board and it offers the possibility to plug additional microphones using MP34DT01 based coupon evaluation boards (STEVAL-MKI129V* or STEVAL-MKI155V*).

- The X-NUCLEO-CCA02M1 enables the acquisition and streaming of up 4 microphones using both I²S and SPI bus available on ST morpho connector.

Key Products on board

**MP34DT01-M:** Ultra-compact, low-power, omnidirectional, digital MEMS microphone built with a capacitive sensing element and an IC interface.

* is used as a wildcard character for related part number

Latest info available at www.st.com X-NUCLEO-CCA02M1
1. For F4xx STM32 Nucleo motherboard, there is an hardware conflict between the X-NUCLEO-IKS01A2 expansion board and the X-NUCLEO-CCAM02M1 expansion board through the Arduino UNO R3 extension connector. The hardware conflict is onto 5, 6 and 7 pin of the CN9 arduido
   
a) For X-NUCLEO-IKS01A2:
   - In the pin 5 (SB27) and 6 (SB26) there are the interrupts INT1 and INT2 for LSM6DSL component (used for the feature hardware)
   - In the pin 7 (SB25) there is the interrupt for LPS22HB component
   
b) For X-NUCLEO-CCAM02M1:
   - In the pin 5 (SB7) there is the clock for the Microphones
   - In the pin 6 (SB15) there is the clock x2 for the Microphones
   - In the pin 7 (SB17) there is the connection for the microphone PDM34 (solder bridge open as default)

2. For F4xx STM32 Nucleo motherboard, there is an hardware conflict between the X-NUCLEO-IKS01A3 expansion board and the X-NUCLEO-CCAM02M1 expansion board through the Arduino UNO R3 extension connector. The hardware conflict is onto 5, 6 and 7 pin of the CN9 arduido
   
a) For X-NUCLEO-IKS01A3:
   - In the pin 5 (SB43) and 6 (SB45) there are the interrupts INT1 and INT2 for LSM6DSL component (used for the feature hardware)
   - In the pin 7 (SB47) there is the interrupt for LPS22HB component
   
b) For X-NUCLEO-CCAM02M1:
   - In the pin 5 (SB7) there is the clock for the Microphones
   - In the pin 6 (SB15) there is the clock x2 for the Microphones
   - In the pin 7 (SB17) there is the connection for the microphone PDM34 (solder bridge open as default)
3. With L4 STM32 Nucleo motherboard:
   a) before to connect the board X-NUCLEO-CCA02M1 with the STM32 L4 Nucleo motherboard through the Morpho connector layout onto X-NUCLEO-CCA02M1 board:
      • close the solder bridges SB12, SB16 and open the solder bridges SB7, SB15 and SB17 (To enable the signal clock from L4 Nucleo motherboard)
      • if additional microphones are plugged in the board, close the solder bridge SB17.

   b) before to connect the X-NUCLEO-IKS01A2 expansion board with the X-NUCLEO-CCA02M1 expansion board:
      • remove the solder bridge SB25 if additional microphones are plugged onto X-NUCLEO-CCA02M1 board

   c) before to connect the X-NUCLEO-IKS01A3 expansion board with the X-NUCLEO-CCA02M1 expansion board:
      • remove the solder bridge SB47 if additional microphones are plugged onto X-NUCLEO-CCA02M1 board
STEVAL-STLKT01V1 Hardware Description

- STEVAL-STLKT01V1 is the development kit for the SensorTile board (STLCS01V1), a highly Integrated Development Platform with a broad range of functionalities aiming to improve system design cycle and accelerate delivery of results

- Two host boards are also provided as part of the kit, both featuring SWD programming interface
  - Cradle expansion has a plugin connection for SensorTile Core System and an Arduino interface
  - The Cradle is a small host featuring battery charger and SD card interface that supports on-the-field testing and data acquisition campaigns
STEVAL-BCNKT01V1 Hardware Description

- STEVAL-BCNKT01V1 is the starter kit for the BlueCoin board (STEVAL-BCNCS01V1), a highly integrated development and prototyping platform for augmented acoustic and motion sensing, aiming to improve system design cycle and accelerate delivery of results.

- Two host boards are also provided as part of the kit:
  - The CoinStation provides audio output, battery management and two Time-of-flight ranging sensors.
  - The Cradle is a small host board featuring USB and SD card interfaces, it is useful for on-the-field testing and data acquisition campaigns.

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**BlueCoin Core System**

- STEVAL-BCNCS01V1
- STM32F446
- BLUENRG-MS
- BALF-NRG-01D3
- LPS22HB
- LSM303AGR
- LSM6DSM
- 2 x Buttons
- Expansion Connectors
- SMD Antenna

**CoinStation**

- STEVAL-BCNST01V1
- 3.5mm audio jack
- Battery connector
- SWD

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**BlueCoin Cradle**

- STEVAL-BCNCR01V1
Multi sensor kit with portable sensor box and smart sensor app

Hardware Description

The STEVAL-MKSBOX1V1 (SensorTile.box) is a ready-to-use box kit with wireless IoT and wearable sensor platform to help you use and develop apps based on remote motion and environmental sensor data, regardless of your level of expertise.

The SensorTile.box board fits into a small plastic shroud with a long-life rechargeable battery, and the ST BLE Sensor app on your smartphone connects via Bluetooth to the board and allows you to immediately begin using the wide range of default IoT and wearable sensor applications.

SensorTile.box includes a firmware programming and debugging interface that allows professional developers to engage in more complex firmware code development using the STM32 Open Development Environment (STM32 ODE), which includes a sensing AI function pack with neural network libraries.

Key Product on board

- Ultra-low-power STM32L4 Series MCUs based on ARM® Cortex®-M4 MCU 120 MHz with 2048 kbytes Flash (STM32L4R9I)
- Accurate temperature: STTS22H
- Low power precise 6x IMU: LSM6DSOX
- Stand-alone XLs: LIS3DHH, LIS2DW12
- Magnetometer: LIS2MDL
- Altimeter / pressure sensor: LPS22HH
- Wide-band microphone: MP23ABS1
- Humidity sensor: HTS221

Latest info available at www.st.com

STEVAL-MKSBOX1V1
Software Description

FP-SNS-ALLMEMS2 is an STM32Cube function pack which lets you connect your IoT node to a smartphone via BLE and use a suitable Android™ or iOS™ application, like the STBLESensor app, to view real-time environmental and motion sensor data, digital microphone and battery levels. It provides features similar to the FP-SNS-ALLMEMS1 function pack, but with a different implementation for ultra-low power consumption.

The package also enables advanced functions such as voice communication over BLE, sound source localization and acoustic beam forming using inputs from multiple microphones, as well as sensor data fusion and accelerometer-based real-time activity recognition, audio data logging and MEMS sensor data logging on SD card.

This package, together with the suggested combination of STM32 and ST devices, can be used to develop specific wearable applications or smart things applications in general, where ultra-low power consumption is a key requirement.

Key features

- Complete firmware to develop an IoT node with BLE connectivity, digital microphone, environmental and motion sensors.
- Middlewares libraries for sensor data fusion and accelerometer-based real-time activity recognition, acoustic source localization and beam forming, audio processing and streaming over BLE communication profile, SD Card data logging FreeRTOS operate system.
- Compatible with STBLESensor application for Android/iOS, to perform sensors data reading, audio and motion algorithms features demo, and firmware update (FOTA).
- Easy portability across different MCU families, thanks to STM32Cube.
- Free, user-friendly license terms.

Latest info available at www.st.com

FP-SNS-ALLMEMS2
Software Overview

**Overall Software Architecture**

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STM32Cube Hardware Abstraction Layer (HAL)
FP-SNS-ALLMEMS2: STM32Cube function pack for ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors

Hardware and Software overview

Setup & Demo Examples

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STM32 Open Development Environment: Overview
Setup & Demo Examples

HW prerequisites

- 1x Bluetooth Low Energy Expansion Board (X-NUCLEO-IDB05A1)
- 1x Motion MEMS and Environmental Sensor Expansion Board (X-NUCLEO-IKS01A2)
- 1x Digital MEMS Microphone Expansion Board (X-NUCLEO-CCA02M1)
- 1x STM32 Nucleo Development Board (NUCLEO-F446RE or NUCLEO-L476RG)
- 1x Android™ or iOS™ device
- 1x PC with Windows 7 and above
- 1x USB type A to Mini-B USB cable

It is necessary to connect the boards in the order shown in this picture.
Setup & Demo Examples

HW prerequisites and setup with BlueCoin (1/2)

• 1x BlueCoin Kit (STEVAL-BCNKT01V1):
  • BlueCoin Core System: BCNCS01V1
  • BlueCoin Coin Station: BCNST01V1
  • BlueCoin Cradle: BCNCR01V1
  • Battery
  • Programming cable

• 1x Android™ or iOS™ device

• 1x PC with Windows 7 and above

• 1x STM32-Nucleo or ST-Link programmer

• 1x USB type A to Mini-B USB cable for the ST-Link

• 1x USB type A to Micro-B USB cable for BlueCoin Cradles and Coin Station
Setup & Demo Examples
HW prerequisites and setup with BlueCoin (2/2)

• In order to program the board you need to connect an external ST-Link to the SWD connector on the cradles, a 5pin flat cable is provided within the BlueCoin Kit package.

• The easiest way is to get an STM32-Nucleo board which includes an ST-Link V2.1 programmer.

• Be sure that CN2 Jumpers are OFF and connect your STM32 Nucleo board to the ClueCoin Coin Station through the provided cable paying attention to the polarity of the connectors. Pin 1 can be identified by a little circle on the PCB silkscreen (STM32 Nucleo board and BlueCoin Coin Station)
Setup & Demo Examples

HW prerequisites and setup with SensorTile (1/2)

- 1x SensorTile Kit (STEVAL-STLKT01V1):
  - SensorTile Core System: STLCS01V1
  - SensorTile Cradle eXpansion: STLCX01V1
  - SensorTile Cradle: STLCR01V1
  - Battery
  - Programming cable

- 1x Android™ or iOS™ device

- 1x PC with Windows 7 and above

- 1x STM32-Nucleo or ST-Link programmer

- 1x USB type A to Mini-B USB cable for the ST-Link

- 1x USB type A to Micro-B USB cable for SensorTile Cradles
• In order to program the board you need to connect an external ST-Link to the SWD connector on the cradles, a 5pin flat cable is provided within the SensorTile Kit package.

• The easiest way is to get an STM32-Nucleo board which includes an ST-Link V2.1 programmer.

• Be sure that CN2 Jumpers are OFF and connect your STM32 Nucleo board to the SensorTile Cradle through the provided cable paying attention to the polarity of the connectors. Pin 1 can be identified by a little circle on the PCB silkscreen (STM32 Nucleo board and SensorTile Cradle Expansion) or by the square shape of the soldering pad of the connector (SensorTile Cradle).
Setup & Application Examples

**HW prerequisites for STEVAL-MKSBOX1V1**

- 1x STEVAL-MKSBOX1V1 evaluation board
- Laptop/PC with Windows 7, 8 or 10
- 1 x microUSB cable
- 1x USB type A to Mini-B USB cable
- ST-Link/V2 in-circuit debugger/programmer for STM8 and STM32
Setup & Demo Examples
SW prerequisites

- **STSW-LINK009**
  - ST-LINK/V2-1 USB driver

- **STSW-LINK007**
  - ST-LINK/V2-1 firmware upgrade

- **FP-SNS-ALLMEMS2**
  - Copy the .zip file content into a folder on your PC. The package will contain source code example (Keil, IAR, System Workbench) based only on NUCLEO-F446RE or NUCLEO-L476RG or STEVAL-BCNKT01V1 or STEVAL-STLKT01V1 or STEVAL-MKSBOX1V1

- **ST BLE Sensor** Application for **Android/iOS** to download from Google Store / iTunes
FP-SNS-ALLMEMS2 Bluetooth low energy and sensors software

1. www.st.com/stm32ode-fp

2. Select FP-SNS-ALLMEMS2

3. Download & unpack

4. Download & unpack

   Docs

   BSP, HAL and drivers

   BlueNRG-MS, BlueNRG2, Audio, Motion, FatFs, FreeRTOS

   Application example

   Boot loader binary

   .\Projects\Multi\Applications\ALLMEMS2\EWARM\STM32F446RE-Nucleo

5. Compile/Flash and Run the project

6. Android™/iOS™ smartphone and ST BLE Sensor application

IMPORTANT:
Read the chapter “The Boot Process” on User Manual for understanding how to install the Boot Loader on the board.
1. How to install the pre-compiled binary:

   • Inside the package and for each supported platform there is one folder called “Binary”.

   • It contains:
     
     • pre-compiled FP-SNS-ALLMEMS2 FW that could be flashed to a supported STM32 Nucleo, BlueCoin, SensorTile or SensorTile.box Board using the ST-Link at the right position (0x08004000)
       • Important Note: this pre-compiled binary is compatible with the FOTA update procedure

     • pre-compiled FP-SNS-ALLMEMS2+BootLoader FW that could be directly flashed to a supported STM32 Nucleo, BlueCoin, SensorTile or SensorTile.box Board using the ST-Link or by doing “Drag & Drop” (the latter only for STM32 Nucleo boards)
       • Important Note: this pre-compiled binary is not compatible with the FOTA update procedure
2. How Install the code after compiling the project:

• Compile the project with your preferred IDE

• On Windows: for each IDE and for each platform there is one batch script:

  IAR toolchain Embedded Workbench V8.32.3:
  • CleanALLMEMS2_IAR__IAR_IKS01A2_F446.bat or CleanALLMEMS2_IAR__IKS01A3_F446.bat
  • CleanALLMEMS2_IAR__IKS01A2_L476.bat or CleanALLMEMS2_IAR__IKS01A3_L476.bat
  • CleanALLMEMS2_IAR_yy.bat (yy → ST or BC)

  System Workbench for STM32 Version IKS01A2_ n 2.9.1.201905031422:
  • CleanALLMEMS2_SW4STM32__IKS01A2_F446.bat or CleanALLMEMS2_SW4STM32__IKS01A3_F446.bat
  • CleanALLMEMS2_SW4STM32__IKS01A2_L476.bat or CleanALLMEMS2_SW4STM32__IKS01A3_L476.bat
  • CleanALLMEMS2_SW4STM32_yy.bat (yy → ST or BC or ST.box)

  µVision toolchain - MDK-ARM Professional Version: 5.27.1:
  • CleanALLMEMS2_MDK_ARM__IKS01A2_F446.bat or CleanALLMEMS2_MDK_ARM__IKS01A3_F446.bat
  • CleanALLMEMS2_MDK_ARM__IKS01A2_L476.bat or CleanALLMEMS2_MDK_ARM__IKS01A3_L476.bat
  • CleanALLMEMS2_MDK-ARM_yy.bat (yy → ST or BC or ST.box)

• For Linux/iOS: only for Openstm32 IDE and for each platform there is one OpenOCD:

  For Nucleo F446/L476:
  • CleanALLMEMS2_SW4STM32__IKS01A2_F446.sh or CleanALLMEMS2_SW4STM32__IKS01A3_F446.sh
  • CleanALLMEMS2_SW4STM32__IKS01A2_L476.sh or CleanALLMEMS2_SW4STM32__IKS01A3_L476.sh

  For STEVAL-STLKT01V1/STEVAL-MKSTBOX1V1/STEVAL-BCNKT01V1:
  • CleanALLMEMS2_SW4STM32_yy.sh (yy → ST or BC or ST.box)

It’s necessary to edit this file for setting the right installation and Library path

• These scripts perform the following steps:

  1. Full Flash Erase
  2. Flash the right BootLoader at the right position (0x08000000)
  3. Flash the ALLMEMS2 firmware at the right position (0x08004000)
     ➢ This is the firmware that was compiled with the IDE
     ➢ This firmware is compatible with the FOTA update procedure
  4. Save a complete Binary FW that includes both ALLMEMS2 and the BootLoader
     ➢ This binary can be directly flashed to a supported STM32 Nucleo or SensorTile board or BlueCoin board using the ST-Link or by doing “Drag & Drop” (the latter only for STM32 Nucleo boards)
     ➢ Important Note: this additional pre-compiled binary is not compatible with the FOTA update procedure
Flash Management and Boot Process

Flash Structure for STM32F446RE

Boot Sequence

START → OTA? → YES → Erase “Region 2” → Copy FOTA from “Region 3” to “Region 2”

NO → JUMP TO APPLICATION → Delete FOTA “magic number” in “Region 3” → Restart the board

FLASH Organization
Using serial line monitor – e.g. Tera Term

FP-SNS-ALLMEMS2 for NUCLEO-F446RE / NUCLEO-L476RG

- Pressing the **RESET** User button on STM32 Nucleo board You could see the initialization phase

- When the boards are connected to an Android or iOS device, you can see what is transmitted via BLE

Configure the serial line monitor (speed, LF)
FS-SNS-ALLMEMS2

ST BLE Sensor Application for Android/iOS (1/6)

- **Environmental page**
- **Accelerometer plot**
- **Microphones level plot**
- **DS3/DSM/DSL Menu Events**
- **RSS & Battery Page**

**Hardware Features – Android Version**

- **DSO/DSOX/DSL Event**
- **Multiple events page**
- **Pedometer**
- **Wake Up**
- **Orientation**

**KNOWN LIMITATION**

For NUCLEO-F446RE board, there is a hardware conflict between the boards:
- X-NUCLEO-IKS01A2 and the X-NUCLEO-CCA02M1.
- X-NUCLEO-IKS01A3 and the X-NUCLEO-CCA02M1.

The hardware features of the LSM6DSL are disabled.
NOTE
When the data logging starts, the other ST BLE Sensor app functions are disabled and the data logging goes on even if the app is closed. The RTC alarm is used to log the selected data with the logging interval chose.

(1) Feature not available on NUCLEO-F446RE and STEVAL-BCNKT01V1
(2) Feature not available on STEVAL-STLKT01V1 and STEVAL-MKSBX1V1
(3) Feature available on NUCLEO-F446RE and STEVAL-BCNKT01V1
(4) Feature available on STEVAL-STLKT01V1 and STEVAL-MKSBX1V1
If Settings is chosen, it is possible to change the node name using the node configuration.
For STEVAL-STLKT01V1 (SensorTile) and STEVAL-MKSBOX1V1 (SensorTile.box) SD data logging is available for Environmental, Magnetometer, Gyroscope, Accelerometer and Audio data.

Below, the debug console commands to start the data logging:

- `start/stop`: to start/stop the data logging for environmental, Accelerometer, Magnetometer and Gyro data.
- `AudioStart/AudioStop`: to start/stop the data logging for Audio data.

It is not possible starting the data logging for MEMS and audio data together. When the data logging is started (audio or MEMS), the others functionality of the ST BLE Sensor app is disabled and the data logging go on even if the app is closed (It is necessary to restart the app if the data logging must be stopped).
FP-SNS-ALLMEMS2

ST BLE Sensor Application for Android/iOS (5/6)

Firmware Upgrade – Android version

Menu option

Firmware upgrade page

Firmware update file selection

Application page during FOTA and on completion

Terminal window information during FOTA
Insert here a valid ASR key.

Hold on & speak!

Sending request...

hello what's your name

Token not recognized
Documents & Related Resources
(1/3)

All documents are available in the DESIGN tab of the related products webpage

FP-SNS-ALLMEMS2

- **DB3673**: STM32Cube function pack for ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors – **data brief**
- **UM2439**: Getting started with the STM32Cube function pack for ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors – **user manual**
- Software setup file

X-NUCLEO-CCA02M1

- Gerber files, BOM, Schematics
- **DB2593**: Digital MEMS microphones expansion board based on MP34DT01-M for STM32 Nucleo – **data brief**
- **UM1900**: Getting started with the digital MEMS microphones expansion board based on MP34DT01-M for STM32 Nucleo – **user manual**

X-NUCLEO-IDB05A1

- Gerber files, BOM, Schematic
- **DB2592**: Bluetooth Low Energy expansion board based on SPBTLE-RF module for STM32 Nucleo – **data brief**
- **UM1912**: Getting started with X-NUCLEO-IDB05A1 Bluetooth low energy expansion board based on SPBTLE-RF module for STM32 Nucleo – **user manual**

Consult www.st.com for the complete list
Documents & Related Resources (2/3)

All documents are available in the DESIGN tab of the related products webpage

X-NUCLEO-IKS01A2
- Gerber files, BOM, Schematic
- DB3009: Motion MEMS and environmental sensor expansion board for STM32 Nucleo – data brief
- UM2121: Getting started with the X-NUCLEO-IKS01A2 motion MEMS and environmental sensor expansion board for STM32 Nucleo – user manual

X-NUCLEO-IKS01A3
- Gerber files, BOM, Schematic
- DS3851: Motion MEMS and environmental sensor expansion board for STM32 Nucleo – data brief
- UM2559: Getting started with motion MEMS and environmental sensor expansion board for STM32 Nucleo – user manual

STEVAL-BCNKT01V1
- Gerber files, BOM, Schematic
- DB3258: BlueCoin Starter kit – data brief
- UM2240: Getting started with the STEVAL-BCNKT01V1 BlueCoin starter kit: augmented acoustics, motion sensing development and prototyping platform – user manual

Consult www.st.com for the complete list
Documents & Related Resources

All documents are available in the DESIGN tab of the related products webpage

STEVAL-STLKT01V1
• Gerber files, BOM, Schematic
• DB2956: SensorTile development kit – data brief
• UM2101: Getting started with the STEVAL-STLKT01V1 SensorTile integrated development platform – user manual

STEVAL-MKSBOX1V1
• Gerber files, BOM, Schematic
• DB3903: SensorTile.box wireless multi sensor development kit with user friendly app for IoT and wearable sensor applications – data brief
• UM2580: How to use the wireless multi sensor development kit with customizable app for IoT and wearable sensor applications – user manual

Consult www.st.com for the complete list
FP-SNS-ALLMEMS2: STM32Cube function pack for ultra-low power IoT node with BLE connectivity, digital microphone, environmental and motion sensors
Hardware and Software overview

Setup & Demo Examples
Documents & Related Resources

STM32 Open Development Environment: Overview
STM32 Open Development Environment
Fast, affordable Prototyping and Development

• The STM32 Open Development Environment (STM32 ODE) is an open, flexible, easy and affordable way to develop innovative devices and applications based on the STM32 32-bit microcontroller family combined with other state-of-the-art ST components connected via expansion boards. It enables fast prototyping with leading-edge components that can quickly be transformed into final designs.

For further information, please visit www.st.com/stm32ode