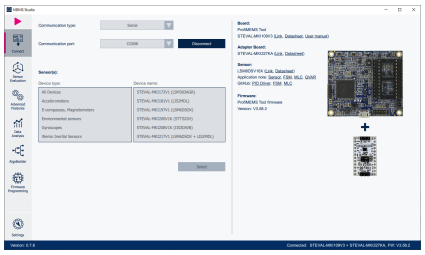
MEMS-Studio

Data brief

Software solution for MEMS sensors with graphical no-code design of algorithms and development of embedded AI features



Features

- Sensor configuration
  - Easy sensor configuration and evaluation
  - Access to the full sensor register map
  - Interrupt status monitoring
- Sensor data analysis
  - Runtime sensor data visualization charts (line charts, bar graphs, 3D plots, …)
  - Data logging to .csv file
  - Offline data visualization, data labeling, and editing
  - Fast Fourier transform (FFT) analysis of online and offline data
  - Spectrogram analysis of online and offline data
- Application development
  - Testing of the advanced embedded features (FIFO, pedometer, free fall, …) in the sensor
  - In-sensor AI design and programming for the finite state machine (FSM), machine learning core (MLC), and intelligent sensor processing unit (ISPU)
  - Visualization and data logging of the output of the embedded software libraries
  - Development of no-code algorithms for data processing in STM32 microcontrollers
- Support for Windows, macOS, and Linux operating systems
- Network updates with automatic notification of new releases

Product summary	
MEMS Studio	MEMS-Studio
Professional MEMS tool	STEVAL-MKI109V3
STM32 Nucleo development boards	STM32 Nucleo
Motion MEMS and environmental sensor expansion boards for STM32 Nucleo	X-NUCLEO-IKS01A3 X-NUCLEO-IKS4A1 X-NUCLEO-IKS02A1
SensorTile.box PRO	STEVAL-MKBOXPRO
STWIN.box	STEVAL-STWINBX1

Description

MEMS-Studio is a complete desktop software solution designed to develop embedded AI features, evaluate embedded libraries, analyze data, and design no-code algorithms for the entire portfolio of MEMS sensors. This unique software solution offers a versatile development environment, enabling the evaluation and programming of all MEMS sensors, launching a new generation of solutions that expand the functions of the well-established applications Unico-GUI, Unicleo-GUI, and AlgoBuilder.

MEMS-Studio facilitates the process of implementing proof of concept using a graphical interface without writing code for STM32 microcontrollers. This solution allows configuring sensors and embedded AI (machine learning and neural networks), leveraging on a machine learning core (MLC), neural networks for the ISPU, and finite state machines (FSM). It reuses embedded software libraries, combines multiple functionalities in a single project, and visualizes data in real time using plot and display.

MEMS-Studio offers the following user experience:

- Sensor evaluation for motion, environmental, and infrared sensors in the MEMS portfolio
- Configuration and testing of in-sensor features such as the finite state machine(FSM), machine learning core (MLC), intelligent sensor processing unit (ISPU)
- Runtime and offline data analysis
- No-code graphical design of algorithms

Revision history

Table 1. **Document revision history**

Date	Version	Changes
16-Nov-2023	1	Initial release

IMPORTANT NOTICE – READ CAREFULLY

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgment.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, refer to www.st.com/trademarks. All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2023 STMicroelectronics – All rights reserved