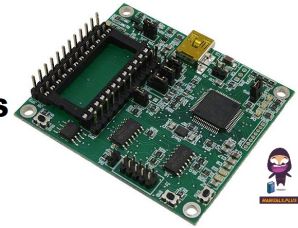**Manuals+** — User Manuals Simplified.

STEVAL-MKI109D
Professional MEMS
Tool Evaluation
Board

STMicroelectronics STEVAL-MKI109D Professional MEMS Tool Evaluation Board User Guide

Contents

STMicroelectronics

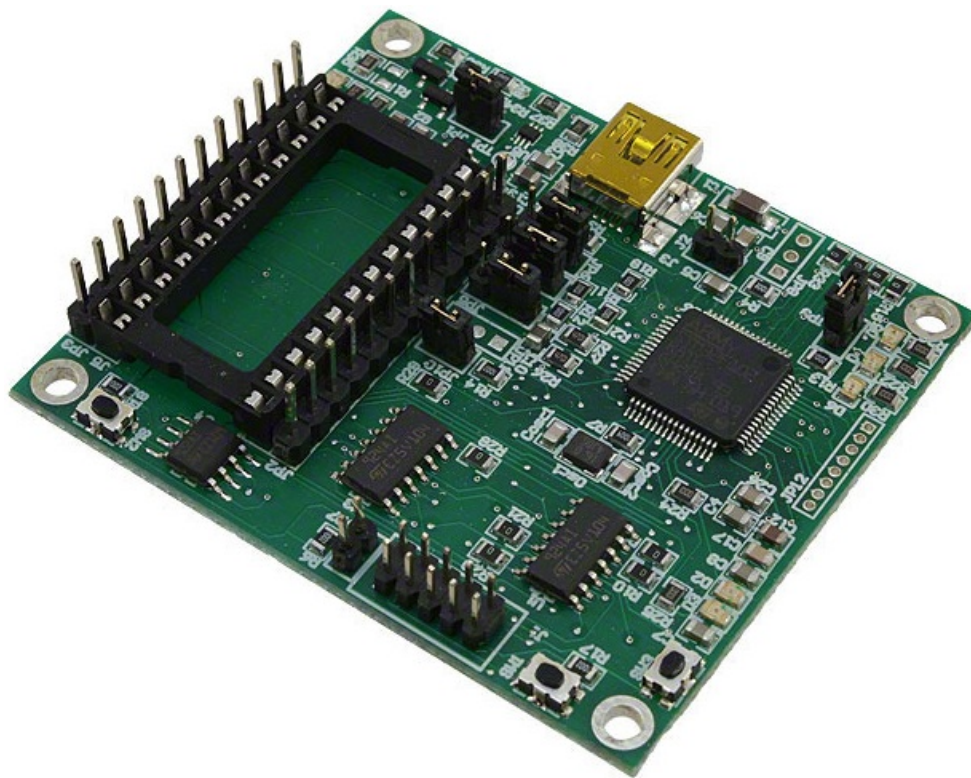**STMicroelectronics STEVAL-MKI109D Professional MEMS Tool Evaluation Board**

Product Usage Instructions

- Plug the STEVAL-MKI109D to the PC with a USB-C cable.
- Launch MEMS Studio. The serial port is automatically selected.
- Press Connect.
- If older firmware is recognized by MEMS Studio, a message will appear.
- You can download the firmware using STM32Cube Programmer or ignore the warning message.
- Select the board from the list or write the board name in the Direct device search.
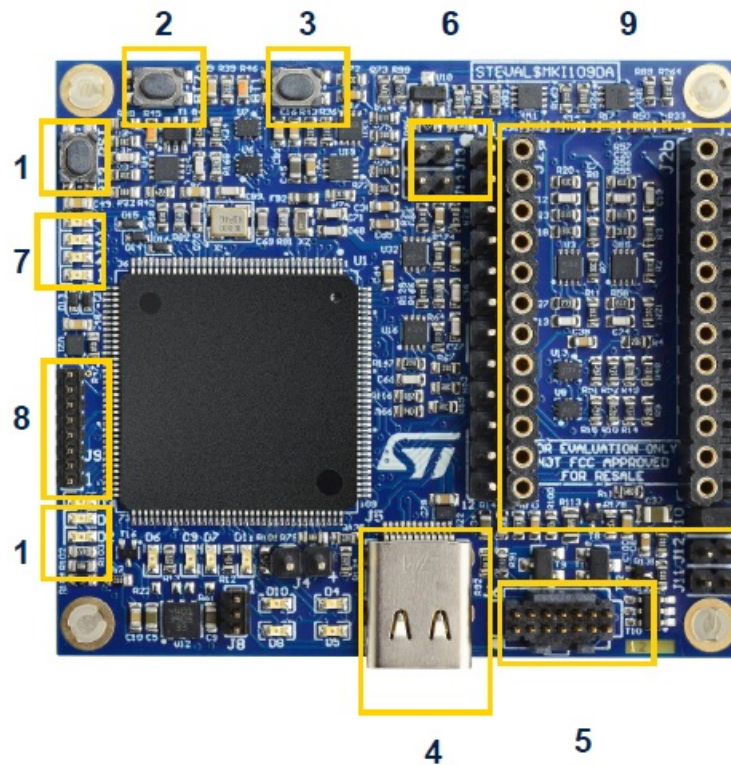
FAQ

- **What is MEMS Studio?**
    - MEMS Studio is a desktop software solution for a 360-degree MEMS sensor portfolio experience. It provides a versatile development environment for evaluating and programming all MEMS sensors, developing embedded AI features, evaluating embedded libraries, analyzing data, and designing no-code algorithms. MEMS Studio includes Unico-GUI, Unicleo-GUI, and AlgoBuilder.
- **How do I update the firmware of STEVAL-MKI109D using MEMS Studio?**
    - To update the firmware, plug the STEVAL-MKI109D into the PC using a USB-C cable, launch MEMS Studio, press Connect after the serial port is selected, and follow the on-screen instructions for firmware upgrade.

STEVAL-MKI109D hardware overview

Top layer: main features

1. Button BT3 used to RESET STM32
2. Button BT2 is used as the GPIO of STM32. It's used to enter in DFU mode

3. Button BT1 connected to STM32 GPIOs

4. USB Type-C connector

5. The j6 connector can be used to reprogram the STM32 and debug the code

6. Jumpers J13 (VDD) and J14 (VDDIO)

7. User LEDs linked to INT1.INT4 of adapter

8. The J9 can be used for general-purpose SPI / I2C bus

9. Female connector to plug MEMS adapter board / Kit

Bottom layer: main features

1. microSD card slot (SD card not included)

2. J7 connector for auxiliary SPI / I2C / GPIOs (not soldered)

3. 4 spacers to ensure that the microSD connector doesn't touch the bottom surface
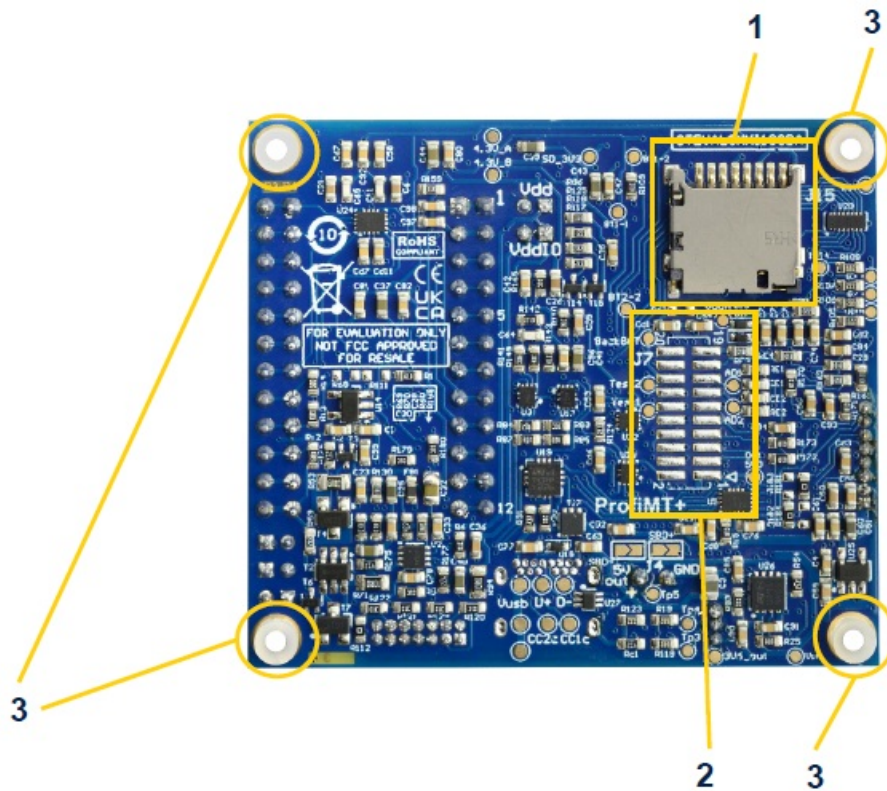
MEMS Studio Software Overview

What's MEMS Studio?

One desktop software solution for a 360-degree MEMS sensor entire portfolio experience

Experience a versatile **development environment**, enabling the **evaluation and programming** of all MEMS sensors

Develop embedded **AI features**, evaluate embedded **libraries**, **analyze data**, and design **no-code algorithms**

Discover the **all-in-one solution** that includes Unico-GUI, Unicleo-GUI and AlgoBuilder
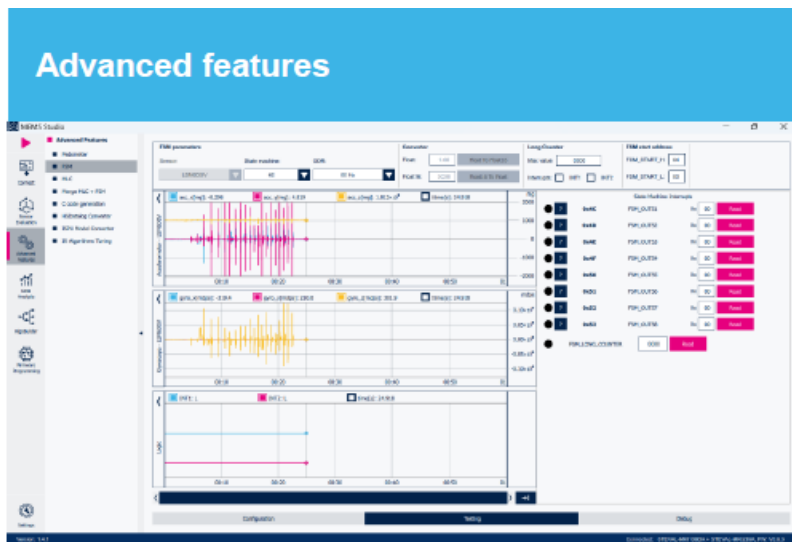
MEMS Studio's main functionalities

- Select the type of communication and power supply and select the adapter board

- Advanced features configuration, testing, and debug

Demo board setup with external adapter or kit
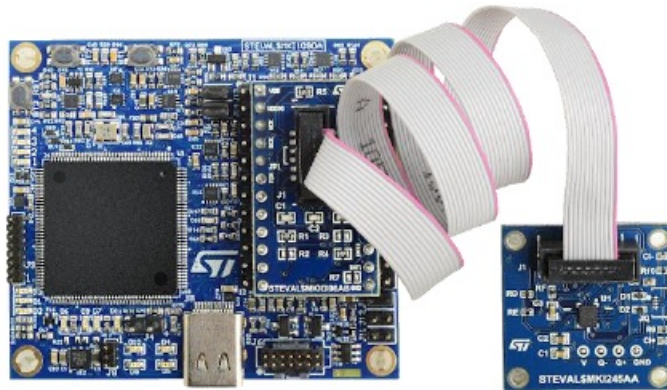
DIL24 adapter boards

Adapter

- Standard DIL24 adapter
- Can include different consumers, industrial, or automotive sensors

Remote kit

- Allows placing the sensor in a different position compared to being plugged on the main board
- Suit many industrial applications

vAFE kit

- Kits containing electrodes that can be stacked on the standard DIL24 adapter
- Used for detecting biopotential signals

MEMS Studio: connect and update STEVAL-MKI109D firmware (when required)

1. Plug the STEVAL-MKI109D to the PC with a USB-C cable
2. Launch MEMS Studio

   The serial port is automatically selected
3. Press Connect
4. Firmware upgrade

   In case older firmware is recognized by MEMS Studio, a message will appear. It's possible to download the firmware using STM32Cube Programmer or ignore the warning message.
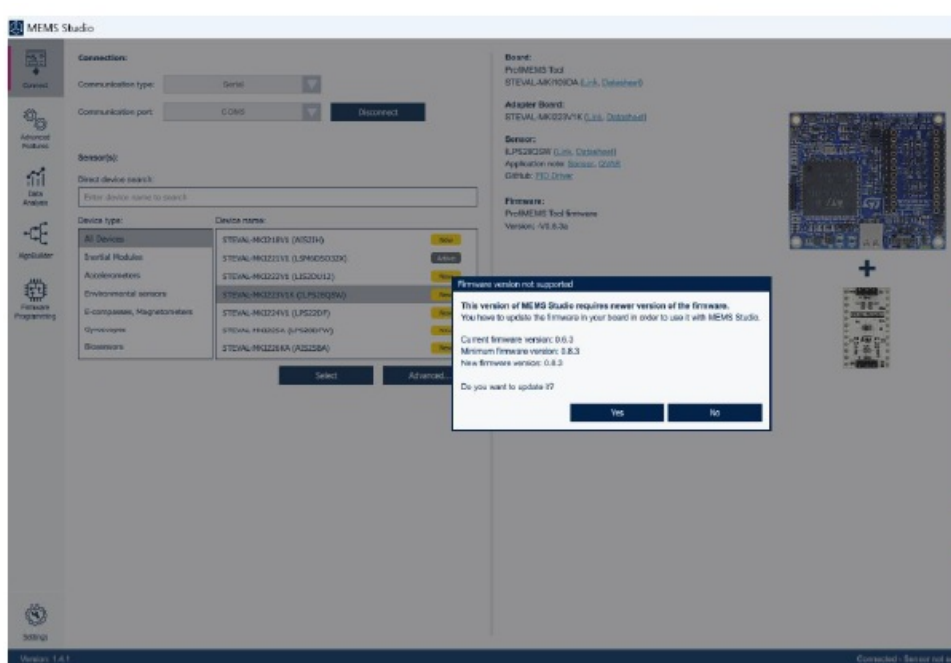
MEMS Studio: select the board and connect

- Select the board from the list Or write the board name in the "Direct device search"
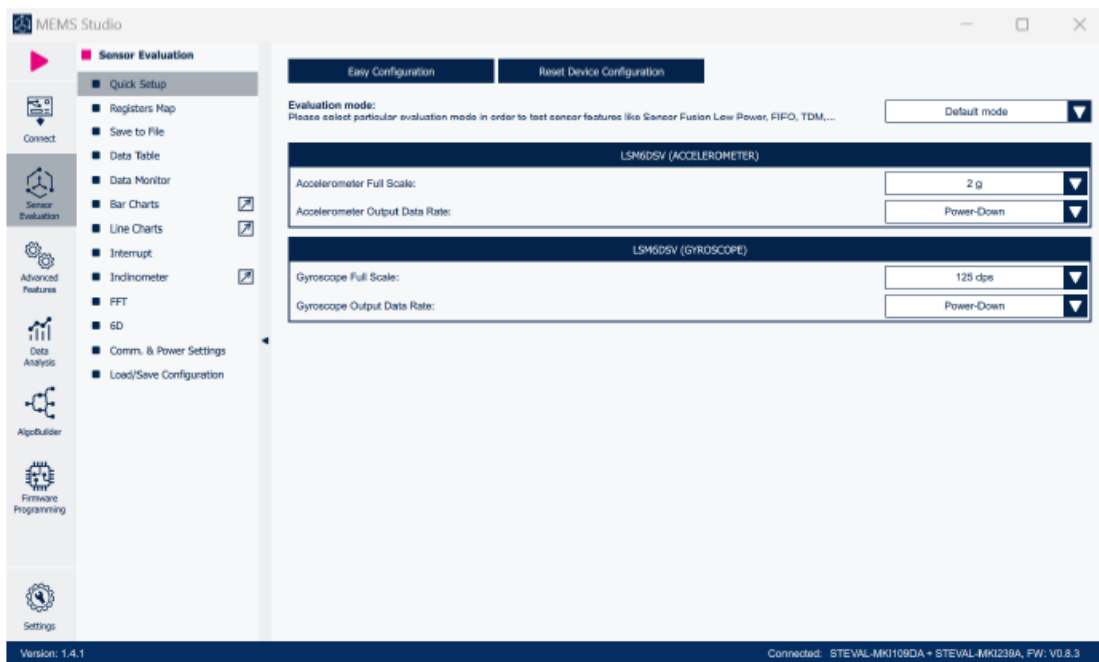

MEMS Studio setup

STEVAL-MKI239A configuration

- When the board has been selected, the default VDD and VDDIO supply voltages are applied to DIL24 to verify

the communication, and WHO_AM_I

- When the device responds correctly, start the GUI for a dedicated board with default register values
- To see the basic output, press the Easy Configuration button

MEMS Studio evaluation

STEVAL-MKI239A evaluation

- In MEMS Studio you can navigate in the left menu (Connect, Sensor evaluation, Advanced feature, Data Analysis,…..) and in the submenu items.
- In Sensor Evaluation, the following sub-menus are available:
- Quick setup
- Register Map
- Save to file
- Data table
- ……
- Load/save configuration
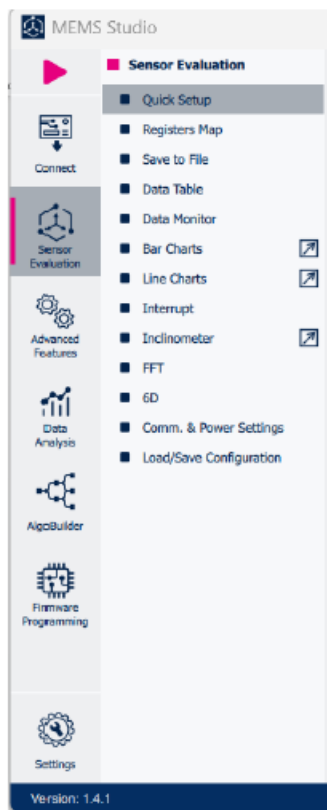
STEVAL-MKI239A basic test

- Go in the Sensor Evaluation menu and select the Line Charts submenu
- To view the accelerometer and gyroscope trend, press the Start/Stop button

Documents & related resources

Resources for STEVAL-MKI109D

Professional MEMS tool: evaluation board for all ST MEMS sensors

- Get the board now! **https://estore.st.com/en/steval-mki109d-cpn.html**

- Discover the **data brief**
- Read our **user manual**
- Show **schematic** and **bill of material**
- Find answers in **ST's MEMS & Sensors community**

Our technology starts with You

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Documents / Resources

STMicroelectronics STEVAL-MKI109D Professional MEMS Tool Evaluation Board [pdf] User Guide
STEVAL-MKI109D Professional MEMS Tool Evaluation Board, STEVAL-MKI109D, Professional MEMS Tool Evaluation Board, MEMS Tool Evaluation Board, Evaluation Board, Board

References

- **User Manual**