How to use the automotive safety software ASM330LHBxx_ASILB_library

Introduction

This user manual provides guidelines and recommendations for the proper use of the automotive safety software ASM330LHBxx_ASILB_library in Unico-GUI for the ASM330LHB and ASM330LHBG1 inertial modules. This library is used in target ASIL B applications that need information about the linear accelerations and angular rates of a vehicle.

Unico-GUI is a cross-platform graphical user interface (GUI) running on Windows, Linux, and Mac OS for the demonstration boards of MEMS sensors such as accelerometers, gyroscopes, magnetometers, and environmental sensors available in the STMicroelectronics portfolio.

Unico-GUI interacts with all the MEMS demonstration boards supported by the STEVAL-MKI109V3 motherboard (professional MEMS tool), including the STEVAL-MKI236A board utilized in the use case described in this document.

1 Usage guide

After launching the Unico-GUI software, choose the STEVAL-MKI236A board with ASM330LHBxx_ASIL_B support, and click on the [**Select Device**] button. Once the device is selected, the main window appears in a few seconds.

Note: The current firmware implementation communicates with the sensor using the SPI communication protocol.

Figure 1. Unico launcher

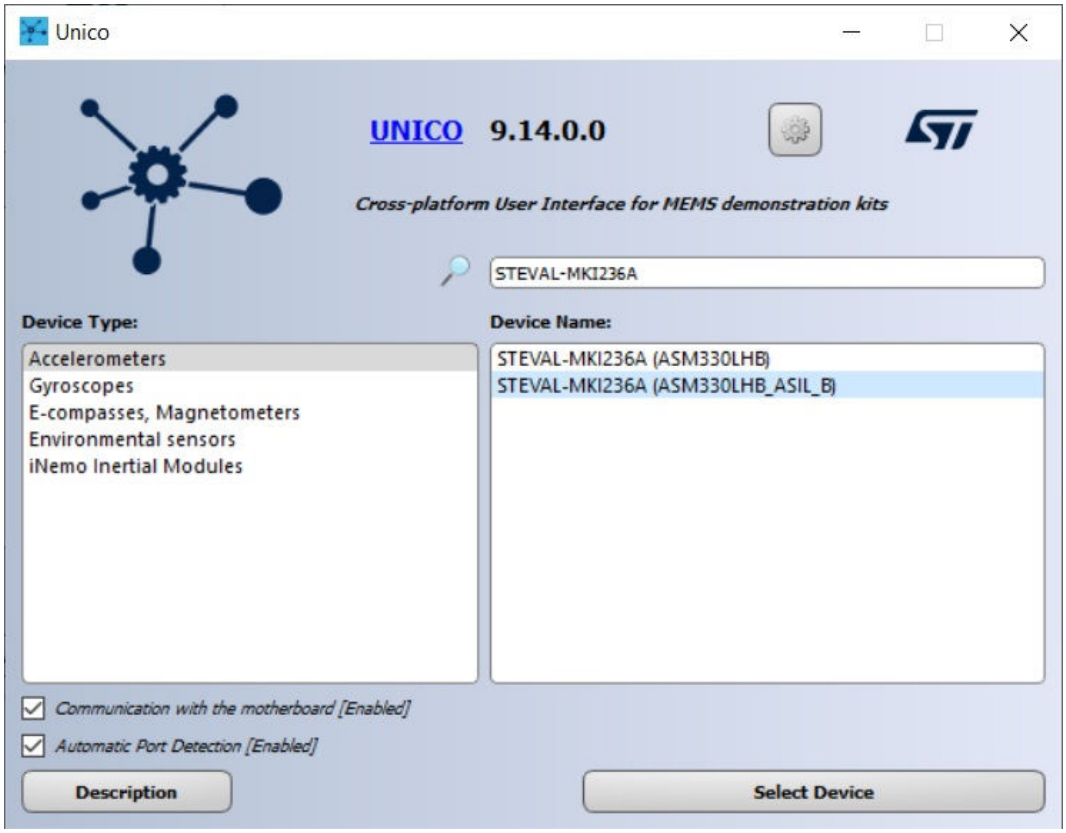


Figure 2. **Unico main window**

The integration provided consists of the following tools:

- Accelerometer plots
- Gyroscope plots
- Data visualization

Figure 3. **Plot tool**

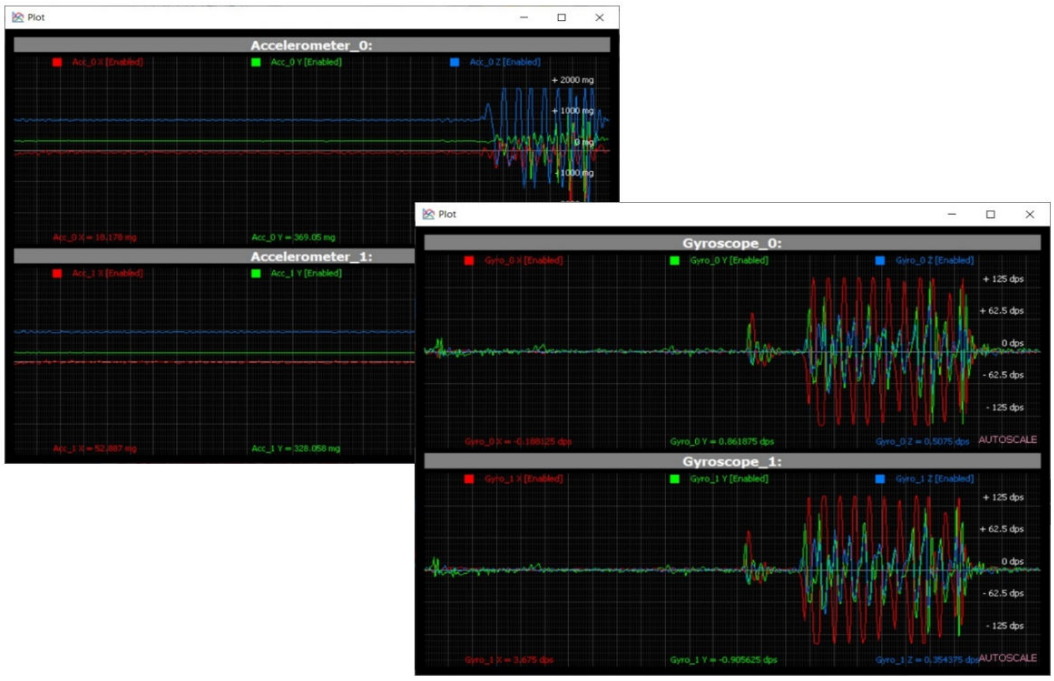
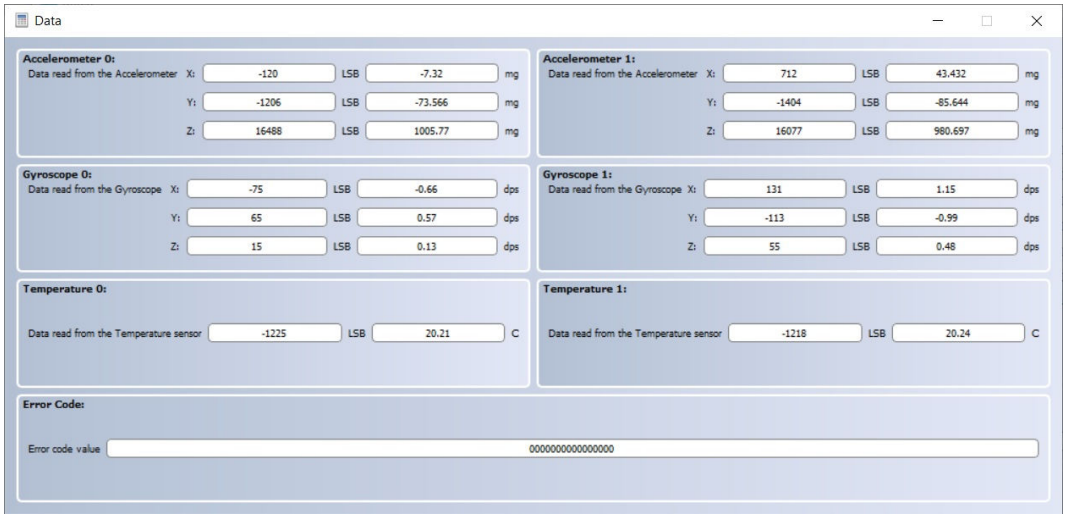


Figure 4. **Data tool**



2 Library configuration

The main window includes the following tabs:

- [**Options**]
- [**Save**]

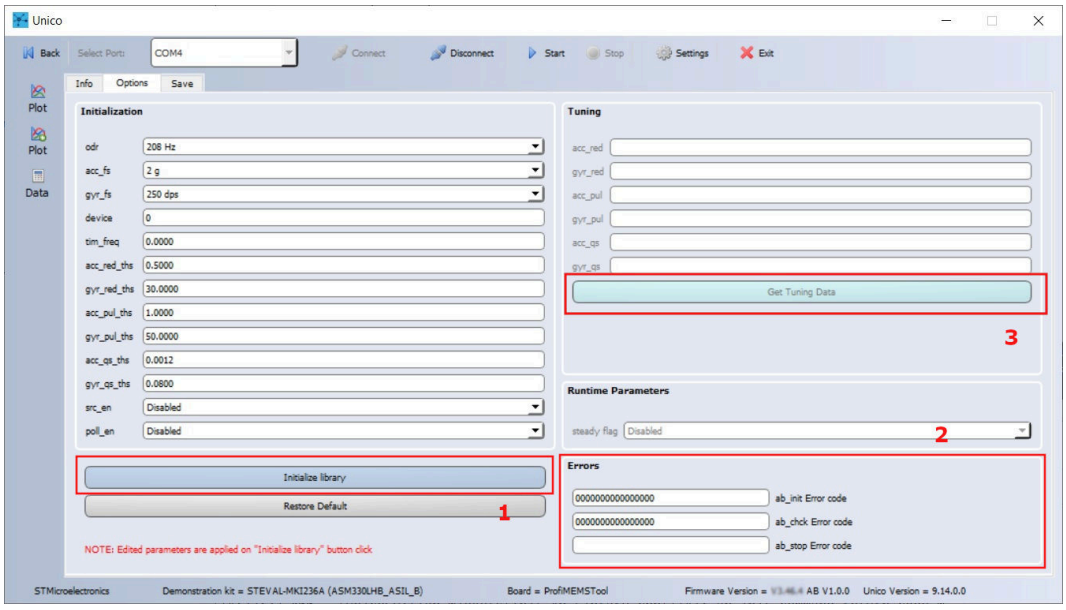
The [**Options**] tab allows the user to initialize ab_struct and set selected parameters in the device once the button [**Initialize library**] (button 1 in Figure 5) is clicked. This button requests the execution of the ab_init and ab_chck commands. All parameters are set in ab_struct, including the read-only “device” parameter, which cannot be edited by the user since it is hardcoded according to the device selected.

Once the [**Initialize library**] button is clicked, if the ab_init Error code is null, the start button is enabled, and the sensor data stream can be requested.

The [**Errors**] groupbox (box 2 in Figure 5) lists the following error codes:

- [**ab_init Error code**] (populated after the ab_init execution triggered by the [**Initialize library**] button)
- [**ab_chck Error code**] (populated after the ab_checkup execution triggered by the [**Initialize library**] button)
- [**ab_stop Error code**] (populated after the [**Get Tuning Data**] button is clicked)

Figure 5. [Options] tab



Unico button command	ASM330LHBxx_ASILB_library
[**Start**]	ab_start
[**Stop**]	ab_stop
[**Initialize library**]	ab_init + ab_checkup

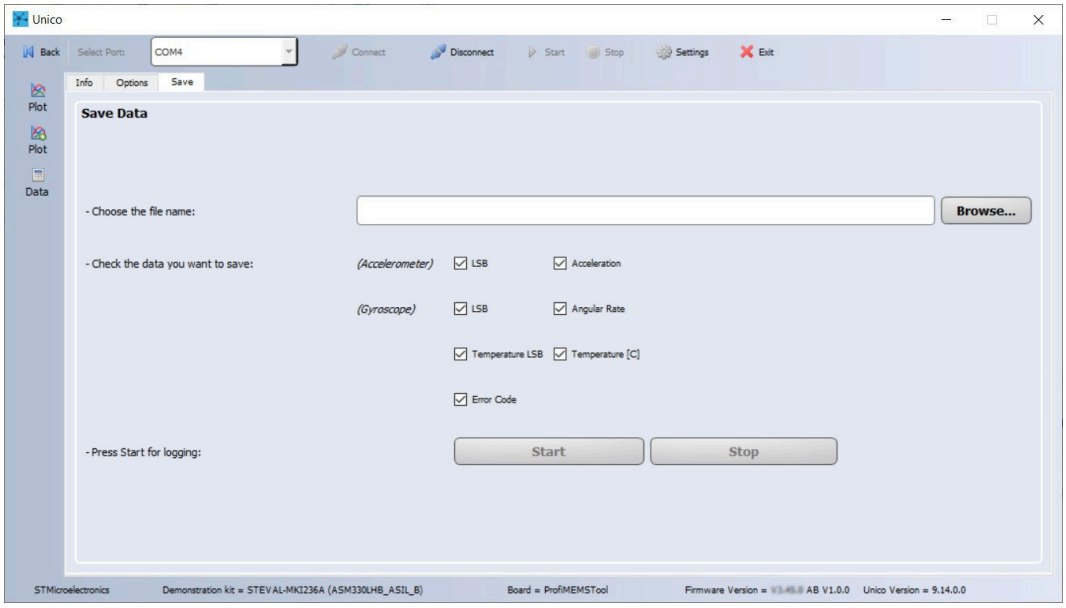
The [**Tuning**] groupbox includes the tuning parameters retrieved upon a stop, requested by clicking on the [**Get Tuning Data**] button (button 3 in Figure 5). This button cannot be clicked if the [**Start**] button was never pressed.

The [**Runtime Parameters**] box in the [**Options**] tab contains the [**steady flag**] control to set the steady flag parameter in the device while the sensors are streaming data. The [**steady flag**] should be enabled when the device is in steady condition, and it enables dedicated checks during the execution of the ab_process instructions. Once the control value has changed, the **steady flag setter** command is sent to the library with the value to be set.

3 Logging data

The [**Save**] tab allows the user to save a stream of sensor output data, including the error code, in a dedicated log file selected by clicking on the [**Browse**] button. The user can select data to store. Once the destination file path is selected, the [**Start**] and [**Stop**] buttons define the acquisition period.

Figure 6. [Save] tab



Revision history

Table 1. **Document revision history**

Date	Version	Changes
17-Apr-2023	1	Initial release

Contents

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