Real-time gyroscope calibration software for STM32Cube

### Features
- Real-time gyroscope calibration algorithm (under OPEN.MEMS license) based on gyroscope and accelerometer data
- Complete middleware to build applications on top of X-CUBE-MEMS1
- Sample application for transmitting real time sensor data to a PC
- Easy portability across different MCU families thanks to STM32Cube
- PC-based Windows application to log sensor data
- Free user-friendly license terms
- Sample implementation available on X-NUCLEO-IKS01A2 and X-NUCLEO-IKS01A1 (with optional STEVAL-MKI160V1) expansion boards, mounted on a NUCLEO-F401RE or NUCLEO-L476RG development board.

### Description
The osxMotionGC add-on software package for X-CUBE-MEMS1 software runs on STM32 Nucleo and includes drivers for recognizing inertial sensors. It provides real-time gyroscope calibration through angular zero-rate level coefficients (offset) used to correct gyroscope data.

The algorithm is provided in static library format and is designed to be used on STM32 microcontrollers based on the ARM Cortex-M3 or ARM Cortex-M4 architecture.

It is built on top of STM32Cube software technology that ease portability across different STM32 microcontrollers.

The software comes with sample implementation running on X-NUCLEO-IKS01A1 (with optional STEVAL-MKI160V1) or X-NUCLEO-IKS01A2 expansion board on a NUCLEO-F401RE or NUCLEO-L476RG development board.
Detailed description

What is STM32Cube?

STMCube™ is designed by STMicroelectronics to reduce development effort, time and cost across the entire 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

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 and some middleware components for serial communication with a PC.

The drivers abstract low-level hardware details and allow middleware components and applications to access sensor data in a hardware independent fashion.

The osxMotionGC real-time software acquires data from the accelerometer and gyroscope and, for each axis, counts the angular zero-rate level coefficient (offset), used to compensate raw data coming from the gyroscope.

The osxMotionGC package also includes a sample application to start experimenting with code that enables sensor data logging on a PC.
## Revision history

Table 1: Document revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-Jan-2017</td>
<td>1</td>
<td>Initial release.</td>
</tr>
</tbody>
</table>
IMPORTANT NOTICE – PLEASE 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 acknowledgement.

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. 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.

© 2017 STMicroelectronics – All rights reserved