eMD-SmartMotion_ICM20948
Software Release Notes

CONTENTS

OVERVIEW

This document details the relevant information regarding the eMD-SmartMotion_ICM20948-1.1.0 software release.

SUPPORTED SENSORS

- ICM20948

SOFTWARE MODULES INCLUDED

The eMD-SmartMotion package includes all the necessary files to create a custom application for any of the supported ICM sensors (see above).
The package is organized as follow
- **doc**: Document(s) describing the use of this firmware development platform.
- **EMD-App**: contains sample firmware source and project files.
  - o **src:**
    - ▪ **At the top level:** Shared .c & .h files.
    - ▪ **ASF:** Shared Atmel system files.
    - ▪ **config:** Shared config files.
    - ▪ **ICM*:** Sensor specific files, main.[c,h], sensor.[c,h] and system.[c,h].
  - o ***.cproj:** AtmelStudio project file for the supported sensor.
- **EMD-Core:** Contains TDK driver files. These files are built into an archive libEMD-Core-ICM*.a. Each supported sensor has it's own .a file.
  - o **config :** The Makefile(s) used to create the sensor driver archives.
  - o **sources/Invn:** TDK libraries source files.
  - o ***.cproj:** AtmelStudio project files for each of the supported sensors.
- **scripts –** Batch files for building and flashing release versions of the firmware for each sensor.
- **tools –** The files required to run the host application sensor-cli.
- **EMD-G55-ICM*.atsln –** Atmel Studio solution files for each of the supported sensors.
- **release –** Contains precompiled elf and binary files

SUPPORTED FEATURES

Sensor features supported:
- Raw accelerometer
- Raw Gyroscope
- Calibrated accelerometer
- Calibrated gyroscope
- Uncalibrated gyroscope
- Game rotation vector
- Gravity
- Linear Acceleration

Optional sensor features supported:
- Calibrated magnetometer (AKM9916 only)
- Uncalibrated magnetometer
- Rotation vector
- Geomagnetic rotation vector
- Step Detector
- Step Counter
- Tilt Detector
- Pick-Up Gesture
- BAC (Activity Classifier)

- B2S
- SMD

NEW FEATURES
- Addition of Accel and gyro offset driver API
- Support for non-default mag mounting matrix

KNOWN ISSUES

- SPI clock interface speed should not be set higher than 2.5MHz to ensure sensor data consistency
- SMD detection for running like motion has not been supported
- Occasional Time-stamp jitter observed during stress-test
  Occasionally, accelerometer data in wrong rate and/or no magnetometer data have been seen after many iteration of command sequences like, set odr, enable-disable continuous and non-continuous sensors. This unexpected system behavior has been seen during stress-test, only for SPI configuration on SmartMotion platform (Atmel G55 based). The state can be recovered by restarting the sensor-cli application (resets the device in software) or resetting the device manually. The issue has not been seen for SmartMotion I2C interface or other MCU platforms using SPI interface.

TEST PLATFORM

This section describes the software test platform used during the test

Software Component	
Package	eMD-SmartMotion_ICM20948-1.1.0
Host	Windows 7

ICM20948:

Hardware Component	
eMD Platform	SmartMotion board with onboard ICM20948

NOTES

This release provides standalone example applications that run on the eMDSmartMotion platform only. A host application, sensor-cli, that runs on a Windows PC and communicates with the eMD-SmartMotion firmware through a TDK transport protocol is included within this release.

COMPLIANCE DECLARATION DISCLAIMER

InvenSense believes the environmental and other compliance information given in this document to be correct but cannot guarantee accuracy or completeness. Conformity documents substantiating the specifications and component characteristics are on file. InvenSense subcontracts manufacturing and the information contained herein is based on data received from vendors and suppliers, which has not been validated by InvenSense.

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