# *eMD-SmartMotion_ICM20948*

## *Software Release Notes*

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## OVERVIEW

This document details the relevant information regarding the eMD-SmartMotion_ICM20948-1.1.1 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.
    - ***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].
    - ***.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 its own .a file.
    - ***config :*** The Makefile(s) used to create the sensor driver archives.
    - ***sources/Invn:*** TDK libraries source files.
    - ***.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

## RESOLVED ISSUES

- [CUS-3563] End customer report gyro output become strange for ICM-20948/DMP
- [ESM-153] GRV convergence takes long

## 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

ICM20948:

| Software Component | |
|---|---|
| Package | eMD-SmartMotion_ICM20948-1.1.1 |
| Host | Windows 7 |

| Hardware Component | |
|---|---|
| eMD Platform | SmartMotion board with onboard ICM20948 |

## NOTES

This release provides standalone example applications that run on the eMD-SmartMotion 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.

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