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# MMA9553L Version 1.33 Software Release Notes

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## 1 Introduction

This release note documents the Freescale MMA9553L, version 1.33 pedometer product.

## 1.1 Requirements

### 1.1.1 Development tools

This MMA9553L release was compiled and tested with the following development tools:

- CodeWarrior Development Studio for Microcontrollers Version 10.1
  - Support available for ColdFire V1 devices
  - Support available for MMA955xL devices
  - MMA955xL user-mode service pack

CodeWarrior versions 10.3 and newer have the MMA955xL user-mode service pack included automatically. If problems are encountered with CodeWarrior, users are encouraged to use CodeWarrior version 10.1.

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### 1.1.2 System requirements

The system requirements are defined by the requirements of the development tools. There are no special host system requirements for the MMA9553L.

### 1.1.3 Target requirements

The Freescale MMA9553L is used in conjunction with the KITMMA955xLEVM evaluation board.

## 2 What Is New?

This section describes major changes, new features, and bug fixes for the current and all prior releases.

**Release 1.33**

Major changes and new features

- The firmware supports software reset via slave port command. Due to hardware implementation, it is strongly recommended that software reset only be performed while operating the slave port in $I^2C$ mode. Hardware reset has always been supported.
- Current consumption during sleep mode reduced.

Bug fixes

- It is not possible to get into ROM Command Mode. (ENGR00241715)
- The MMA9553L does not respond after resting for 30 minutes. (ENGR00267909)

**Release 1.32**

Major changes and new features

- The default frequency changed from 488 Hz to 30 Hz.

Bug fixes

- There are no bug fixes in this release.

# 3 Release Content

| Deliverable | Location | Status |
|---|---|---|
| **Preinstalled Freescale Firmware** | | |
| MMA9553L firmware | FLASH: Bytes 0 through 15360<br>SRAM:<br>Bytes 0x800000 to 0x80054F (MMA9550 statically allocated RAM, and pedometer heap RAM)<br>Bytes 0x800680 to 0x8007FF (user and supervisor stacks) | Updated |
| **Demo Applications** | | |
| PC demo application | Contact FAEs | No changes |
| **Documentation** | | |
| MMA955xL Software Reference Manual | | No changes |
| MMA9553L Software Reference Manual | | Updated |
| MMA955xL Hardware Reference Manual | | Updated |

# 4 Release Overview

This product provides pedometer functionality to the MMA9550L.

# 5 Current Consumption for the MMA9553L

Two firmware configurations and two accelerometer input sequences were permuted to collect four different current measurements. A DMM was used to measure average total (analog+digital) current across J9 on the KITMMA9550LEVM board. All numbers are in µA.

Firmware Configurations:

- **Stop on Idle:** The power control application was reconfigured for run mode with stop on idle using the slave port command: `12 20 06 01 00`. All other configuration values were left in their default states. (The slave port commands are defined in the MMA955xL Software Reference Manual.)
- **Stop on Idle, Enable Autonomous Suspend:** The power control application was reconfigured as above. In addition, the pedometer application was reconfigured to enable the autonomous suspend function using the slave port command: `15 20 00 04 0E 66 11 9A`. This command sets the SLEEPMIN = 0.9 *g* and SLEEPMAX = 1.1 *g*.

Accelerometer inputs:

- **Idle on Desk:** Real-time accelerometer data was used while the MMA955xL evaluation board rested on the desk.
- **Inject:** A test vector was injected into the system, bypassing the real-time accelerometer data.

| Accelerometer input at 30 Hz sample rate | Stop on idle | Stop on idle, enable autonomous suspend |
|---|---|---|
| Idle on desk | 180 | 84 |
| Inject | 245 | 215 |

# 6 Known Issues and Limitations

## 6.1 Open tickets

| Ticket number | Priority level | Ticket open date | Ticket summary | Additional comments |
|---|---|---|---|---|
| ENGR00209152 | 3 | 14-May-2012 | The pedometer step count accuracy is less than 98.9% for step counts less than 1000 steps. | The pedometer step count accuracy of 98.9% is verified for greater than 1000 steps. The error for smaller step counts may be due to the perception of end users taking more or less steps when starting and stopping. This impact is greater for shorter step counts. |
| ENGR00209150 | 3 | 14-May-2012 | Steps counted when resting on the seat of a moving automobile experiencing an uneven ride or turning. | The pedometer registers step counts when resting on the seat of a moving automobile experiencing an uneven ride or turning. The signature of these activities is similar to taking a step. The pedometer sees the same motion and correctly interprets them as steps. This situation is reduced if the pedometer worn close to the body. |
| ENGR00209148 | 3 | 14-May-2012 | Default setting for stride length is not 95% accurate for running. | If the end user provides an accurate stride length, then the reported distance calculations demonstrate increased accuracy. |
| ENGR00209147 | 3 | 14-May-2012 | The pedometer occasionally misrepresents activity states. | |
| ENGR00238807 | 4 | 09-Nov-2012 | The device appears to “reset” sometimes when in wake/active mode and consecutive Device ID requests are sent by the host. | The recommended workaround is to avoid making consecutive Device ID requests. |
| ENGR00270576 | 3 | 10-Jul-2013 | The "Boot to ROM" command does not work using SPI communication. | As this is a feature of the hardware, it is considered a limitation. The MMA955xL HWRM is being updated to describe this situation more clearly to avoid customers unintentionally discovering this feature. The workaround is to use $I^2C$ communications for this purpose. |

## 6.2 Compatibility issues

The known compatibility issues include:

- The MMA9550L firmware is used intact, therefore all slave port commands and user applications are compatible (given sufficient memory and CPU bandwidth) with the MMA9553L.
- The MMA9553L overrides the MMA9550L G mode from 8 *g* to 4 *g*. All other MMA9550L defaults are unchanged.
- The MMA9553L overrides the MMA9550L default frequency configuration from 488 Hz to 30 Hz. As a result, the AFE, GPIO, MBOX, FIFO, EVENT_QUEUE, STATUS_REG, RST_CLR_SUSP, LONG_SHORT_INT and CI features also change from 488 Hz tasks to 30 Hz tasks. All other MMA9550L defaults are unchanged.
- The "Boot to ROM" command fails under SPI communication due to the pin muxing on the device. Updates to the evaluation kits provided with the 1.32 release are required to compensate for the hardware.

# 7 Revision History

| Revision number | Revision date | Description |
|---|---|---|
| 1.0 | 08/2013 | • Initial release of Release Notes for version 1.33 |

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