GlobalMems Accelerometer Sensor -Proting Guides

Product: GMA302 & GMA303

Rev: V1.0.0

Date: 11/11/2014

目錄

1. Revision History

Version	Revision Date	Descriptions
1.0.0	11/11/2014	First release of document applicable to gma302 & gma303 products.

2. Preface

This document highlights the fundamental porting procedures to comply with gma302 driver to ACTIONS platform.

3. Release folders

The software release packages contain the following gma30x device specific folders.

a) Kernel Driver
   \GMA30x_Actions_driver \gma302\gma302.*
   \GMA30x_Actions_driver \gma303\gma303.*
   \GMA30x_Actions_driver \gsensor_detect.h

b) HAL
   \GMA30x_Actions_driver \libsensor\sensors.cpp

c) Java Application
   \GMA30x_Actions_driver\device\actions\packages\ActSensorCalib (ACTIONS官方的整合版歸零)

4. Software configuration detail

a) 板級配置

請參閱GS702C_GSensor调试手册_V1.2pdf的5-1

b) 參數配置

請參閱GS702C_GSensor调试手册_V1.2pdf的5-2

5. Software Porting Steps

詳細設定步驟需參閱ACTIONS gsensor移植手冊

5.1 Linux kernel driver porting

Chip info	Slave Address	Who am I Register	Who am I value
GMA302	0x18	0x00	0x02
GMA303	0x18	0x00	0x03

a) 新建源碼目錄：

切換到Gsensor驅動的源碼目錄leopard/platform/drivers/gsensor，將gma302目錄拷貝至此。

所需Makefile & Kconfig從其他sensor裡複製過來修改。

b) 修改編譯配置：

切換到板型目錄leopard/build/gs702c/config/boards，找到對應板型，切換到板型目錄，打開driver_list文件，將要編譯的驅動源碼目錄改為gsensor/gma302，配置方式請參閱GS702C_GSensor调试手册_V1.2pdf的5-1。

c) 修改運行配置：

打開initramfs/init.extra_modules.rc，將加載的gsensor驅動ko文件修改為gsensor_gma302.ko，配置方式請參閱GS702C_GSensor调试手册_V1.2pdf的5-1。

5.2 參數配置

打開fwmisc/config.xml，找到Gsensor對應的配置，根據實際情況修改配置參數，一般只需修改position參數，配置方式請參閱GS702C_GSensor调试手册_V1.2pdf的5-2。

5.3 HAL移植

ACTIONS HAL實現了自動檢測的功能，只需在HAL的支持列表增加1項sSensorSupportList參數描述，HAL就能檢測到Gsensor驅動註冊的input設備。

切換到Sensor HAL 的代碼目錄android/device/actions/hardware/libsensor，打開sensor.cpp文件，找到Sensor支持列表定義sSensorSupportList，增加一項gma302的參數描述。

```
/* Support SENSORS Module */
static const struct sensor_t sSensorSupportList[] = {
        {
          "GMA302 3-axis Accelerometer",
          "GlobalMems",
          1, SENSORS_ACCELERATION_HANDLE,
          SENSOR_TYPE_ACCELEROMETER,
          (32.0f * GRAVITY_EARTH),
          (32.0f * GRAVITY_EARTH) / 1024.0f,       // -16G ~ +16G, 13 bit
          0.145f, 10, 0, 0,
          { (void*)"gma302" }       // reserved[0] --> input device name
        },
        {
          "GMA303 3-axis Accelerometer",
          "GlobalMems",
          1, SENSORS_ACCELERATION_HANDLE,
          SENSOR_TYPE_ACCELEROMETER,
          (32.0f * GRAVITY_EARTH),
          (32.0f * GRAVITY_EARTH) / 1024.0f,       // -16G ~ +16G, 13 bit
          0.145f, 10, 0, 0,
          { (void*)"gma303" }       // reserved[0] --> input device name
        },

};
```

5.4 校準apk移植

Gsensor出場時一班都有校準，但由於安裝外力等因素，到整機還是會有一定的偏差，所以需要校準。ACTIONS SDK已經內置了校準APK，而且APK實現了自動檢測功能，新增一款Gsensor支持，不用重新移植APK的實現，只要在支持列表中增加支持即可。

切換到可校準APK的源碼目錄，android/device/actions/packages/ActSensorCalib，打開/src/com/actions/sensor/calib/SensorControl.java，找到 SENSORNAME 的定義，添加gma302字串，示例如下:

```
Public class SensorControl{
Public final String TAG = "SensorControl",
```

```
Private final String SENSORNAME =
"bma220,bma222,bma250,mma7660,gma301,gma303,gma302",
```

5.5 gsensor 自適應功能移植

詳情見 GS702C_ctp和gsensor自適應使用指南.doc

6. 常用調適方法

請參閱GS702C_GSensor调试手册_V1.2pdf的章節7。

7. 常見問題解決

請參閱GS702C_GSensor调试手册_V1.2pdf的章節8。

7.1 讀寫sysfs文件

/sys/class/input/inputX/

Name	R/W	Description	Example Usage
enable	RW	enable flag for accelerometer	echo 1 > enable
delay	RW	delay in nanosecond for accelerometer	echo 20 > delay
board_position	RW	chip mounting position(1~4 & -1~-4)	echo -3 > board_position
calibration_value	R	show calibration offset	cat calibration_value
calibration_reset	W	clear calibration offset	echo 1 > calibration_reset
calibration_run	W	G sensor calibration	echo 1 > calibration_run
sma	RW	simple Moving Average sensor data(1~16)	echo 4 > sma
value	R	Read sensor data	Cat value
reg_rx	RW	cat: Read from register(show value) echo : Setting the register to be read	echo 0x00 > reg_rx cat reg_rx
reg_tx	RW	cat: Read from register(show value) echo : The value currently being written to the register	
reg	RW	Read gma30x register status	cat reg
fuzz	RW	Input fuzz setup	echo 3 > fuzz
ewma	RW	Exponentially weighted moving average(2,4,8,16)	Echo 4 > ewma