ISL29023 Device Driver Integration Guide

Rev: A2

25 Sept 2013

ISL29023 ALS Sensor Driver Integration Guide

VVDN Contact:

Bhupender Saharan
VVDN Technologies
+1 408 807 3951

bhupi@vvdntech.com

Revision History:

Date	Rev No.	Description	By
20 Aug 2013	A1	ISL29023 ALS Sensor Driver Integration Guide	VVDN
25 Sept 2013	A1	ISL29023 ALS Sensor Driver Integration Guide	VVDN

Table of Contents

1 Introduction

This document describes the device driver integration of "ISL29023 ALS sensor driver" with android and Linux kernel for panda-board, which is developed by VVDN Technologies for Intersil Corporation.

This Document is made for the reference of

- Product managers and QAD at VVDN & Intersil to understand the device driver integration.
- Engineering Team at VVDN for integrating and testing the device driver for panda-board.

2 Extract the Driver package

Extract the Linux kernel driver tar file (VVDN_ISLU_SNSR_ISL29023_1.1.2.1.tar.bz2) for ISL29023 sensor device driver files

```
# tar -xvf  VVDN_ISLU_SNSR_DRIVER_ISL29023__1.1.2.1.tar.bz2
```

The extracted directory will contain the following files

1. ISL29023.c
2. ISL29023.h

3 Copying driver files

1. Copy the `ISL29023.c` to `kernel/driver/input/misc/` directory in the Linux kernel for panda-board

```
# cp ISL29023.c kernel/drivers/input/misc/
```

2. Copy the `ISL29023.h` to standard header file path `kernel/include/linux/` in the Linux kernel for panda-board

```
# cp ISL29023.h kernel/include/linux/
```

4 Adding the driver to kernel build system

4.1 Adding entry in Kconfig

1. Change directory to `kernel/drivers/input/misc` inside the Linux kernel source code for panda-board.

   ```
   # cd kernel/driver/input/misc
   ```

2. Open the Kconfig in the current directory with any editor of choice
3. Go to the end of file and add the following configuration just before the `#endif`

```
config INPUT_ISL29023

     bool "ISL29023 I2C driver for ALS sensor"

     default y
```

```
      depends on I2C=y

      help

      This is a device driver for Intersil Corporation's ISL29023
ALS sensor.
```

4. Save and exit.

Note: This step will add our sensor entry in the kernel's configuration menu. Please deselect this entry using kernel's menuconfig system if its compilation with panda-board is not required.

4.2 Adding entry in Makefile

1. Change directory to `kernel/driver/input/misc` inside the Linux kernel source code for panda-board.
   `# cd kernel/driver/input/misc`
2. Open the Makefile in the current directory with any editor of choice.
3. Go to the end of file and add the following.

```
    obj-$(CONFIG_INPUT_ISL29023)       += ISL29023.o
```

Note: After this step the ISL29023 sensor driver is integrated with kernel build system.

4.3 Add driver and device information in board file

1. Change directory to `kernel/arch/arm/mach-omap2` inside the Linux kernel source code for panda-board.

```
      # cd kernel/arch/arm/mach-omap2
```

2. Edit the file `board-omap4panda.c` under current directory with editor of choice. Do Steps 3 to 5 to edit the file.
3. Include the sensor driver header file at the beginning of file along with other include files

```
      #include  <linux/ISL29023.h>
```

4. Add this global structure declaration to the file

```
Static struct ISL29023_platform_data  ISL29023_data = {

      .gpio_irq  = 39  /* GPIO pin number to be assigned as interrupt

                       For interrupt mode only, otherwise leave as -1 */

};
```

```
static struct i2c_board_info __initdata ISL29023_info[] = {
      {
         I2C_BOARD_INFO("ISL29023",ISL29023_I2C_ADDR),
        .platform_data = &ISL29023_data,
       },
};
```

5. Inside function "`omap4_panda_i2c_init`" add the following code to register ISL29023 device with i2c core.

```
omap_register_i2c_bus(4,400,ISL29023_info,ARRAY_SIZE(ISL29023_info));
```

6. Save and exit

Now the sensor driver is integrated with Linux kernel for panda-board.

NOTE:

1. Please make sure you use one sensor device at a time for GPIO 39 interrupt functionality.
2. Comment the *omap_register_i2c_bus* for other sensor devices of same slave address on same bus.
3. Use gpio_irq = -1 to disable the interrupt functionality for unselected device.
4. Select isl29125 sensor or isl29023 one at a time from menuconfig. Both selection may lead to an I2C slave conflict.