ISL29028A Device Driver Integration Guide

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ISL29028A ALS-PROX Sensor Driver Integration Guide

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Introduction

This document describes the device driver integration of "ISL29028A ALS-PROX 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.

Extract the Driver package

Extract the Linux kernel driver tar file (VVDN_ISLU_SNSR_ISL29028A_1.0.2.1.tar.bz2) for ISL29028A sensor device driver files.

```
# tar -xvf  VVDN_ISLU_SNSR_DRIVER_ISL29028A_1.0.2.1.tar.bz2
```

The extracted directory will contain the following files

- `ISL29028A.c`
- `ISL29028A.h`

Copying driver files

- Copy the `ISL29028A.c` to `kernel/drivers/input/misc/` directory in the Linux kernel for panda-board

  ```
  # cp ISL29028A.c kernel/drivers/input/misc/
  ```

- Copy the `ISL29028A.h` to standard header file path `kernel/include/linux/ of` the Linux kernel for panda-board

  ```
  # cp ISL29028A.h kernel/include/linux/
  ```

- ## Adding the driver to kernel build system

- ### Adding entry in Kconfig

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

    ```
    # cd kernel/drivers/input/misc
    ```

  - Open the Kconfig in the current directory with any editor of choice

  - Go to the end of file and add the following configuration just before the `#endif`

    ```
    config INPUT_ISL29028A

          bool "ISL29028A I2C driver for ALS-PROX sensor"

          default y

          depends on I2C=y

          help

          This is a device driver for Intersil Corporation's
          ISL29028A ALS Proximity sensor.
    ```

  - Save and exit.

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

- ### Adding entry in Makefile

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

    ```
    # cd kernel/drivers/input/misc
    ```

  - Open the Makefile in the current directory with any editor of choice.

  - Go to the end of file and add the following.

```
    obj-$(CONFIG_INPUT_ISL29028A)            += ISL29028A.o
```

Note: After this step the ISL29028A sensor driver is integrated with kernel build system.

- ### Add driver and device information in board file

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

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

- Edit the file `board-omap4panda.c` under current directory with editor of choice. Do

  Steps 3 to 5 to edit the file.

- Include the sensor driver header file at the beginning of file along with other include files.

  ```
  #include <linux/ISL29028A.h>
  ```

- Add this global structure declaration to the file

```
Static struct ISL29028A_platform_data  ISL29028A_data = {
     .gpio_irq  = 39  /* GPIO pin number to be assigned as interrupt
                         For interrupt mode only, otherwise leave as -1 */
};
NOTE: Please assign gpio39 if it is not assigned to any other driver.
It will fail to request otherwise.
```

```
static struct i2c_board_info __initdata ISL29028A_info[] = {
      {
         I2C_BOARD_INFO("ISL29028A",ISL29028A_I2C_ADDR),
        .platform_data = &ISL29028A_data,
       },
};
```

- Inside function "`omap4_panda_i2c_init`" add the following code to register ISL29028A device with i2c core.

```
omap_register_i2c_bus(4,400,ISL29028A_info,ARRAY_SIZE(ISL29028A_info))
;
```

- Save and exit

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

IMPORTANT NOTE:

- Please make sure you use one sensor device at a time for GPIO 39 interrupt functionality.
- Comment the *omap_register_i2c_bus* for other sensor devices of same slave address on same bus.
- Use gpio_irq = -1 to disable the interrupt functionality for unselected device.