Porting Guide of Sensortek stk3x1x Android Optical Sensor Driver for MTK Platform

Version: 1.0

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Sensortek Technology Corporation

Sensortek Technology Corp.
6F-1, No. 5, Taiyuan, 1st St., Jhubei City, Hsinchu County 302, Taiwan
TEL 886-3-560-1000, FAX 886-3-560-1234

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Change Log

Date	Version	Change log	Sponsor	Corresponding Sensortek Android Optical Sensor Driver Pack for MTK platform	Remark
2013/6/25	1.0	Initial Release	Lex Hsieh	V3.1.3 or previous	

Linux Kernel Driver Integrating Notes

1. In ProjectConfig.mk, set
   CUSTOM_KERNEL_ALSPS = stk3x1x
   to build stk3x1x driver.
2. Put stk3x1x.c and stk3x1x.h in stk3x1x folder to the following path:
   mtk_source\mediatek\custom\common\kernel\alsps\stk3x1x\
3. Replace original cust_alsps.c and cust_alsps.h with cust_alsps.c and cust_alsps.h in stk3x1x_driver folder and modify cust_alsps.c:
   a. For Proximity Sensor, driver will only report 0 (near) or 1 (far) to input event system.
      I. Set ".polling_mode_ps =1" to set PS Polling mode.
      II. Set ".polling_mode_ps =0" to set PS Interrupt mode.
   b. For Ambient Light Sensor, driver will report lux value to input event system by lookup table.
      I. Set ".polling_mode_als =1" to set ALS Polling mode.
      II. Set ".polling_mode_als =0" to set ALS Interrupt mode.
   c. Modify ".als_level array" and ".als_value array" if you want to adjust ALS lookup table.
   d. Modify ". psctrl_val", ".alsctrl_val", and ".ledctrl_val" for performance tuning, please refer to stk3x1x datasheet.
   e. ".ps_high_thd_val" and ".ps_low_thd_val" are not used anymore, modify "STK_LT_N_CT", "STK_HT_N_CT", and "STK_MAX_MIN_DIFF" in stk3x1x.c for detection distance tuning.

```
static struct alsps_hw cust_alsps_hw = {
    /* i2c bus number, for mt657x, default=0. For mt6589, default=3 */
#ifdef MT6589
    .i2c_num    = 3,
#elif defined(MT6572)
    .i2c_num    = 1,
#else
    .i2c_num    = 0,
#endif
    //.polling_mode =1,
    .polling_mode_ps =1,
    .polling_mode_als =1,
    .power_id   = MT65XX_POWER_NONE,    /*LDO is not used*/
    .power_vol  = VOL_DEFAULT,          /*LDO is not used*/
    .i2c_addr   = {0x90, 0x00, 0x00, 0x00},  /*STK3x1x*/
    .als_level  = {5,  9, 36, 59, 82, 132, 205, 273, 500, 845, 1136, 1545, 2364, 4655, 6982},   /* als_code */
    .als_value  = {0, 10, 40, 65, 90, 145, 225, 300, 550, 930, 1250, 1700, 2600, 5120, 7680, 10240},    /* lux */
    .state_val = 0x0,       /* disable all */
    .psctrl_val = 0x71,     /* ps_persistance=4, ps_gain=64X, PS_IT=0.391ms */
    .alsctrl_val = 0x38,    /* als_persistance=1, als_gain=64X, ALS_IT=50ms */
    .ledctrl_val = 0xFF,    /* 190mA IRDR, 64/64 LED duty */
    .wait_val = 0x7,        /* 50 ms */
    .ps_high_thd_val = 1700,
    .ps_low_thd_val = 1500,
};
```

4. If ALS/PS interrupt mode is set, please set correct gpio information.

Enable Android Auto-brightness

After you completed the driver, you may see the ALS and PS value by using StkRawViwer.apk. Once the reading is correct, please also enable “Auto-brightness”.

1. If you use overlay for your device setting, please modify config.xml.
2. Or modify source tree directly➔ /android source/ frameworks/base/core/res/res/values/config.xml
Modify the following setting
<bool name="config_automatic_brightness_available">false</bool>
to
<bool name="config_automatic_brightness_available">true</bool>
3. Enable auto-backlight in the following path:
android setting -> Display -> Brightness -> enable Automatic brightness.

Modifications of PowerManagerService (For Reference)

If light sensor reading is correct but back light can't correctly, maybe this is because of wrong "mIsDocked" parameter setting. Please refer to PowerManagerService_revised.java".

Filename	Feature
PowerManagerService_orig.java	Original version of AOSP 2.3.X
PowerManagerService_revised.java	Remove "Docking" and "mHighestLightSensorValue"