



SiS925x USB Touch Driver Porting Guide For Ubuntu 14.04 LTS

深圳领见科技有限公司

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1. Install Requirement

- Ubuntu 14.04 LTS
- Ubuntu 14.04 Kernel Source (above kernel 3.5)

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2. Steps of Driver Installment

2.1. Get Ubuntu 14.04 Kernel Source

2.1.1. Get root privilege

For building kernel conveniently, please get the root privilege. For user who is familiar with Linux operations, we recommend using “sudo” command to replace root privilege.

2.1.2. Update packages

```
cd /usr/src  
apt-get update
```

2.1.3. Install essential packages for make Linux kernel

```
apt-get install libncurses5-dev build-essential zip u-boot-tools sharutils kernel-package
```

2.1.4. Get Linux kernel source code

```
apt-get install linux-source
```

The file “linux-source-3.13.x.tar.bz2” will download to /usr/src.

2.1.5. Extract the kernel source

```
tar jxvf linux-source-<version>.tar.bz2 -C /usr/src
```

<version> depends on different computer, for example : 3.13.0



2.2. Kernel source patching

2.2.1. Add in the start functions in driver

1. Add in “Include File”, “setup-function”, “remove-function” and “id-table” into kernel/drivers/hid/hid-multitouch.c.

(a) Include File

```
/*
 * HID driver for multitouch panels
 *
 * Copyright (c) 2010-2012 Stephane Chatty <chatty@enac.fr>
 ...
#include <linux/device.h>
...
#include <linux/string.h>
#include "hid-sis_ctrl.h"
MODULE_AUTHOR("Stephane Chatty <chatty@enac.fr>");
...

```

(b) “setup-function” in mt_probe() function

```
static int mt_probe(struct hid_device *hdev, const struct hid_device_id
*id)
{
    int ret, i;
    ...

    ret = hid_parse(hdev);
    if (ret != 0)
        return ret;

//SiS set noget for not init reports
if (hdev->vendor == USB_VENDOR_ID_SIS_TOUCH)
{
    hdev->quirks |= HID_QUIRK_NOGET;
printk(KERN_INFO "sis:sis-probe: quirk = %x\n", hdev->quirks);

//SiS FW update
#ifdef CONFIG_HID_SIS_CTRL
    ret = sis_setup_chardev(hdev);
#endif

```

```

        if(ret)
        {
            printk( KERN_INFO "sis_setup_chardev fail\n");
        }
    #endif //CONFIG_HID_SIS_CTRL
    }
    ret = hid_hw_start(hdev, HID_CONNECT_DEFAULT);
    if (ret)
        return ret;
    ...
}

```

(c) “remove-function” in mt_remove () function

```

static void mt_remove(struct hid_device *hdev)
{
    struct mt_device *td = hid_get_drvdata(hdev);

    //SiS FW update
    #ifdef CONFIG_HID_SIS_CTRL
    if (hdev->vendor == USB_VENDOR_ID_SIS_TOUCH)
    {
        sis_deinit_chardev();
    }
    #endif //CONFIG_HID_SIS_CTRL

    hid_hw_stop(hdev);
    kfree(td->slots);
    kfree(td);
    hid_set_drvdata(hdev, NULL);
}

```

(d) “id-table” in mt_devices [] array

Attention:

Please skip this step if kernel version is more than 3.5.

```

static const struct hid_device_id mt_devices[] = {
    /* 3M panels */

```

```

{ .driver_data = MT_CLS_3M,
  HID_USB_DEVICE(USB_VENDOR_ID_3M,
    USB_DEVICE_ID_3M1968) },
...
/* XAT */
{ .driver_data = MT_CLS_DEFAULT,
  HID_USB_DEVICE(USB_VENDOR_ID_XAT,
    USB_DEVICE_ID_XAT_CSR) },
{ .driver_data = MT_CLS_DEFAULT,
  HID_USB_DEVICE(USB_VENDOR_ID_SIS_TOUCH,
    USB_DEVICE_ID_SIS817_TOUCH) },
{ .driver_data = MT_CLS_DEFAULT,
  HID_USB_DEVICE(USB_VENDOR_ID_SIS_TOUCH,
    USB_DEVICE_ID_SISF817_TOUCH) },
...
};

```

2.2.2. Copy Update Firmware Add-On file

Copy “hid-sis_ctrl.c” and “hid-sis_ctrl.h” into kernel/drivers/hid/.

2.2.3. Add in SiS USB Touch Controller PID &VID

1. User can modify 0x0817 behind USB_DEVICE_ID_SIS817_TOUCH to match your device’s PID. On the other side, user can create a new PID definition for your device such as the bold string.
2. Modify ID-Table header file

Attention:

Please check your kernel version and choose the right step,

A. If your kernel version is before or equal to 3.12

Copy scripts listed below and paste it into the bottom of kernel/drivers/hid/hid-ids.h (before #endif).

#define USB_VENDOR_ID_SIS_TOUCH	0x0457
--	---------------



```
#define USB_DEVICE_ID_SIS817_TOUCH      0x0817
#define USB_DEVICE_ID_SISF817_TOUCH     0xF817
```

B. If your kernel version is equal to 3.13

Copy scripts listed below and paste it into the bottom of kernel/drivers/hid/hid-ids.h (before #endif).

```
#define USB_VENDOR_ID_SIS_TOUCH        0x0457
#define USB_DEVICE_ID_SISF817_TOUCH    0xF817
```

C. If your kernel version is more than 3.13

Copy scripts listed below and paste it into the bottom of kernel/drivers/hid/hid-ids.h (before #endif).

```
#define USB_DEVICE_ID_SISF817_TOUCH    0xF817
```

2.2.4. Add into Kconfig

Copy scripts listed below and paste it into the bottom of kernel/drivers/hid/Kconfig (after config HID_MULTITOUCH).

```
config HID_MULTITOUCH
    tristate "HID Multitouch panels"
    ...
    To compile this driver as a module, choose M here: the
        module will be called hid-multitouch.

config HID_SIS_CTRL
    tristate "SiS Touch Device Controller"
    depends on HID_MULTITOUCH
    ---help---
    Support for SiS Touch devices update FW.
```




2.2.5. Add in Makefile

Copy scripts listed below and paste it into kernel/drivers/hid/Makefile (before obj-\$(CONFIG_USB_HID) += usbhid/).

```
obj-$(CONFIG_HID_SIS_CTRL) += hid-sis_ctrl.o
```

2.2.6. Modify the authority of driver for update-FW

Copy "99-sis-usb-touch.rules" into the /etc/udev/rules.d

2.2.7. Add device for hid-core.c

Add "id-table" in hid_have_special_driver[] array of kernel/drivers/hid/ hid-core.c.

```
static const struct hid_device_id hid_have_special_driver[] = {
    { HID_USB_DEVICE(USB_VENDOR_ID_A4TECH, USB_DEVICE_ID_A4TECH_WCP32PU) }
    ...
    { HID_BLUETOOTH_DEVICE(USB_VENDOR_ID_NINTENDO,
    USB_DEVICE_ID_NINTENDO_WIIMOTE2) },
    { HID_USB_DEVICE(USB_VENDOR_ID_SIS_TOUCH,
    USB_DEVICE_ID_SIS817_TOUCH) },
    { HID_USB_DEVICE(USB_VENDOR_ID_SIS_TOUCH,
    USB_DEVICE_ID_SISF817_TOUCH) },
    { }
};
```

2.3. Kernel configure

2.3.1. Setting configure

Set the configure to building kernel.(assume that recent directory is /usr/src/linux-source-3.2.0)

```
cp /boot/config-$(uname -r) .config
```

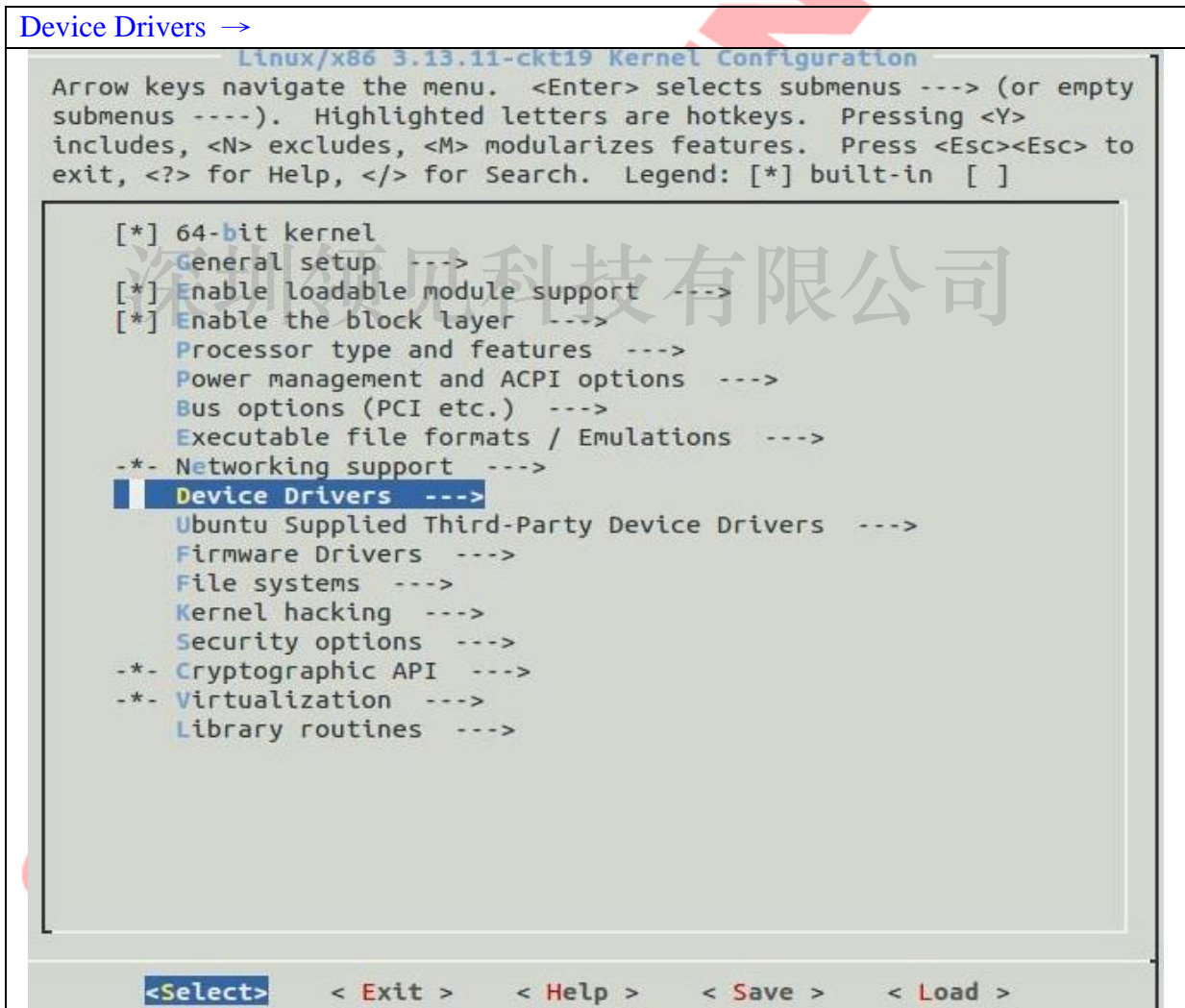
2.3.2. Select the driver for SiS Touch Controller FW update

Select SiS FW update module. (assume that recent directory is /usr/src/linux-source-3.2.0)

```
make menuconfig
```

Select path :

Device Drivers →



```

Linux/x86 3.13.11-ckt19 Kernel Configuration
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]

[*] 64-bit kernel
  General setup --->
[*] Enable loadable module support --->
[*] Enable the block layer --->
  Processor type and features --->
  Power management and ACPI options --->
  Bus options (PCI etc.) --->
  Executable file formats / Emulations --->
-*- Networking support --->
  Device Drivers --->
  Ubuntu Supplied Third-Party Device Drivers --->
  Firmware Drivers --->
  File systems --->
  Kernel hacking --->
  Security options --->
-*- Cryptographic API --->
-*- Virtualization --->
  Library routines --->

<Select> < Exit > < Help > < Save > < Load >
  
```

HID support →

```

Device Drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]
^(-)
PTP clock support --->
Pin controllers --->
-*- GPIO Support --->
{M} Dallas's 1-wire support --->
-*- Power supply class support --->
[*] Adaptive Voltage Scaling class support ----
[*] Hardware Monitoring support --->
-*- Generic Thermal sysfs driver --->
[*] Watchdog Timer Support --->
Sonics Silicon Backplane --->
Broadcom specific AMBA --->
Multifunction device drivers --->
-*- Voltage and Current Regulator Support --->
<M> Multimedia support --->
Graphics support --->
<M> Sound card support ---->
HID support --->
[*] USB support --->
<M> Ultra Wideband devices --->
<*> MMC/SD/SDIO card support --->
<M> Sony MemoryStick card support --->
-*- LED Support --->
[ ] Accessibility support ----
<M> InfiniBand support --->
+ (+)
<Select> < Exit > < Help > < Save > < Load >

```



[*] HID bus support

HID support
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in []

```
{*} HID bus support
[*]  Battery level reporting for HID devices
[*]  /dev/hidraw raw HID device support
<M>  User-space I/O driver support for HID subsystem
<M>  Generic HID driver
      Special HID drivers --->
      USB HID support --->
      I2C HID support --->
```

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<Select> < Exit > < Help > < Save > < Load >



Special HID drivers →

```
HID support
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]

[*] HID bus support
[*] Battery level reporting for HID devices
[*] /dev/hidraw raw HID device support
<M> User-space I/O driver support for HID subsystem
<M> Generic HID driver
[*] Special HID drivers --->
  USB HID support --->
  I2C HID support --->

<Select> < Exit > < Help > < Save > < Load >
```

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<*> HID Multitouch panels → <*> SiS Touch Device Controller

Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty submenus ----). Highlighted letters are hotkeys. Pressing <Y> includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to exit, <?> for Help, </> for Search. Legend: [*] built-in []

```

^(-)
<M> LC-Power
<M> Lenovo ThinkPad USB Keyboard with TrackPoint
<M> Logitech devices
<M>   Logitech Unifying receivers full support
[*]   Logitech force feedback support
[*]   Logitech force feedback support (variant 2)
[*]   Logitech Flight System G940 force feedback support
[*]   Logitech wheels configuration and force feedback support
<M> Apple Magic Mouse/Trackpad multi-touch support
<M> Microsoft non-fully HID-compliant devices
<M> Monterey Genius KB29E keyboard
<*> HID Multitouch panels
<*> SiS Touch Device Controller
[ ]   SiS Touch device debug message(update firmware)
<M> N-Trig touch screen
<M> Ortek PKB-1700/WKB-2000/Skycable wireless keyboard and mouse
<M> Pantherlord/GreenAsia game controller
[*]   Pantherlord force feedback support
<M> Petalynx Maxter remote control
<M> PicoLCD (graphic version)
[*]   Framebuffer support
[*]   Backlight control
[*]   Contrast control
[*]   GPO via leds class
[*]   CIR via RC class
<M> Primax non-fully HID-compliant devices

```

<Select>

< Exit >

< Help >

< Save >

< Load >

2.4. Debug message setting (optional)

Debug message does not necessary in SiS touch driver, but it is very useful when there is something wrong on your touch device. User should decide whether add these debug messages or not. If user does not use debug message, please skip this subsection.

2.4.1. Set kconfig file for kernel configuration

Copy scripts listed below and paste it into the bottom of kernel/drivers/hid/Kconfig (after config HID_MULTITOUCH).

```
config DEBUG_HID_SIS_UPDATE_FW
```

```
bool "SiS Touch device debug message(update firmware)"
```

```
depends on HID_SIS_CTRL
```

```
default n
```

```
---help---
```

```
Say Y here if you want to enable debug message(update firmware) for SiS  
Touch devices. Must enable config HID_SIS_UPDATE_FW first.
```

2.4.2. Include debug message of kernel configuration

The preceding flow is the same with SiS touch driver described in section 2.3.2. At the end, User includes the **SiS Touch device debug message(update firmware)** item to enable what the debug message you want to show.

<*> SiS Touch device debug message(update firmware)

```

Special HID drivers
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]
^(-)
<M> LC-Power
<M> Lenovo ThinkPad USB Keyboard with TrackPoint
<M> Logitech devices
<M>   Logitech Unifying receivers full support
[*]   Logitech force feedback support
[*]   Logitech force feedback support (variant 2)
[*]   Logitech Flight System G940 force feedback support
[*]   Logitech wheels configuration and force feedback support
<M> Apple Magic Mouse/Trackpad multi-touch support
<M> Microsoft non-fully HID-compliant devices
<M> Monterey Genius KB29E keyboard
<*> HID Multitouch panels
<*>   SiS Touch Device Controller
[*]   SiS Touch device debug message(update firmware)
<M> N-Trig touch screen
<M> Ortek PKB-1700/WKB-2000/Skycable wireless keyboard and mouse
<M> Pantherlord/GreenAsia game controller
[*]   Pantherlord force feedback support
<M> Petalynx Maxter remote control
<M> PicoLCD (graphic version)
[*]   Framebuffer support
[*]   Backlight control
[*]   Contrast control
[*]   GPO via leds class
[*]   CIR via RC class
<M> Primax non-fully HID-compliant devices
+ (+)
<Select> < Exit > < Help > < Save > < Load >

```




2.5. Build kernel

2.5.1. Build kernel, install kernel image & update grub menu, reboot

```
make bzImage -j8
```

Build module (Only do one time if you have not modify modules)

```
make modules -j8
```

```
make modules_install
```

```
make install
```

```
reboot
```

Update the firmware of SiS touch Controller can be operated by console mode after reboot with the built kernel.

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3. Touch driver test

After the touch driver is installed and built, there are some steps below to confirm them.

3.1. lsusb

Type command “lsusb” check the VID/PID (Here PID:10b1 is our test touch panel)

```
3us 005 Device 002: ID 04f2:b084 Chicony Electronics Co., Ltd
3us 005 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
3us 004 Device 002: ID 0a5c:2101 Broadcom Corp. BCM2045 Bluetooth
3us 004 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
3us 003 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
3us 002 Device 002: ID 046d:c058 Logitech, Inc. M115 Mouse
3us 002 Device 001: ID VID PID Linux Foundation 1.1 root hub
3us 001 Device 002: ID 0457:10b1 Silicon Integrated Systems Corp.
3us 001 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
```

3.2. xinput

Type command “xinput” and check if the device is an INPUT device.

```
zerget@zerget-usb:~$ xinput
Virtual core pointer                id=2    [master pointer (3)]
├─ Virtual core XTEST pointer       id=4    [slave pointer (2)]
├─ Logitech Unifying Device. Wireless PID:4007 id=8    [slave pointer (2)]
└─ USBest Technology SiS HID Touch Controller id=10   [slave pointer (2)]
Virtual core keyboard              id=3    [master keyboard (2)]
├─ Virtual core XTEST keyboard      id=5    [slave keyboard (3)]
├─ Power Button                    id=6    [slave keyboard (3)]
├─ Power Button                    id=7    [slave keyboard (3)]
└─ AT Translated Set 2 keyboard     id=9    [slave keyboard (3)]
zerget@zerget-usb:~$
```

3.3. USB touch device handlers

Type command “cat /proc/bus/input/devices” and find the messages below.

```
I: Bus=0003 Vendor=0457 Product=0817 Version=0111
N: Name="USBest Technology SiS HID Touch Controller"
P: Phys=usb-ehci-omap.0-1.2/input0
S: Sysfs=/devices/platform/usbhs-omap.0/ehci-omap.0/usb1/1-1/1-1.2/1-1.2:1.0
  /input/input1
```



```
U: Uniq=  
H: Handlers=mouse0 event1  
B: PROP=2  
B: EV=b  
B: KEY=400 0 0 0 0 0 0 0 0 0 0  
B: ABS=2608000 3
```

3.4. Char device node

Type command “ls /dev/sis*” to check device node exist or not.

If device node exists, you will find the messages below.

```
/dev/sis_aegis_hid_touch_device
```

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