



## **SiS USB Touch Driver Porting Guide for Linux**

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## 1. Install Requirement

- Linux Kernel Source
- Development tools

## 2. Steps of Driver Installment

### 2.1. Kernel source patching

Please copy "hid-sis\_ctrl.c" and "hid-sis\_ctrl.h" into (kernel\_src)/drivers/hid folder.

#### 2.1.1. Modify the authority of driver for update-FW

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

#### 2.1.2. Modify specialized driver list

**Attention:** Please check your kernel version.

Add "id-table" in hid\_have\_special\_driver[] array. Please do not copy and paste whole file directly.

##### 2.1.2.1. kernel version is < 4.16 or hid-quirks.c does not exist

Copy high-lighted code listed below and paste it into the bottom of **hid\_have\_special\_driver[]** array at (kernel\_src)/drivers/hid/**hid-core.c**. **Please do not copy and paste whole file directly.**

```
static const struct hid_device_id hid_have_special_driver[] = {
    { HID_USB_DEVICE(USB_VENDOR_ID_3M, USB_DEVICE_ID_3M1968) },
    ...
    { HID_BLUETOOTH_DEVICE(USB_VENDOR_ID_NINTENDO,
        USB_DEVICE_ID_NINTENDO_WIIMOTE) },
    /* SiSdrv Start */
    { HID_USB_DEVICE(0x0457, HID_ANY_ID) },
    /* SiSdrv End */
    { }
};
```

### 2.1.2.2. kernel version is >= 4.16 or hid-quirks.c exists

Copy high-lighted code listed below and paste it into the bottom of **hid\_have\_special\_driver[]** array at (kernel\_src)/drivers/hid/**hid-quirk.c**. **Please do not copy and paste whole file directly.**

```
static const struct hid_device_id hid_have_special_driver[] = {
    #if IS_ENABLED(CONFIG_HID_A4TECH)
        { HID_USB_DEVICE(USB_VENDOR_ID_A4TECH,
        USB_DEVICE_ID_A4TECH_WCP32PU) },
        { HID_USB_DEVICE(USB_VENDOR_ID_A4TECH,
        USB_DEVICE_ID_A4TECH_X5_005D) },
        { HID_USB_DEVICE(USB_VENDOR_ID_A4TECH, USB_DEVICE_ID_A4TECH_RP_649) },
    #endif
    ...
    #if IS_ENABLED(CONFIG_HID_ZYDACRON)
        { HID_USB_DEVICE(USB_VENDOR_ID_ZYDACRON,
        USB_DEVICE_ID_ZYDACRON_REMOTE_CONTROL) },
    #endif
    /* SiSdrv Start */
    #if IS_ENABLED(CONFIG_HID_SIS92XX) ||
    IS_ENABLED(CONFIG_HID_SIS95XX_SIS98XX)
        { HID_USB_DEVICE(0x0457, HID_ANY_ID) },
    #endif
    /* SiSdrv End */
    { }
};
```

### 2.1.3. Modify the start/finish functions in driver

Copy high-lighted code listed below and paste it into (kernel\_src)/drivers/hid/hid-multitouch.c.  
Please do not copy and paste whole file directly.

#### 2.1.3.1. Include File

Add hid-sis\_ctrl.h into include file list.

```
...
#include <linux/string.h>
#include <linux/timer.h>

/* SiSdrv Start */

#include "hid-sis_ctrl.h"

/* SiSdrv End */
```

#### 2.1.3.2. Class definition

Copy high-lighted code listed below to bottom of vendor specific classes.

```
/* vendor specific classes */
...
#define MT_CLS_VTL 0x0110
#define MT_CLS_GOOGLE 0x0111
#define MT_CLS_RAZER_BLADE_STEALTH 0x0112
/* SiSdrv Start */
#define MT_CLS_SIS 0x0457
/* SiSdrv End */
```

Copy high-lighted code listed below to bottom of structure “static const struct mt\_class mt\_classes[]”

```
static const struct mt_class mt_classes[] = {
...
    { .name = MT_CLS_RAZER_BLADE_STEALTH,
      .quirks = MT_QUIRK_ALWAYS_VALID |
                MT_QUIRK_IGNORE_DUPLICATES |
                MT_QUIRK_HOVERING |
                MT_QUIRK_CONTACT_CNT_ACCURATE |
```

```

        MT_QUIRK_WIN8_PTP_BUTTONS,
    },
    /* SiSdrv Start */
    { .name = MT_CLS_SIS,
      .quirks = MT_QUIRK_NOT_SEEN_MEANS_UP |
                MT_QUIRK_CONTACT_CNT_ACCURATE
    },
    /* SiSdrv End */
    {}
};

```

### 2.1.3.3. Start function

Copy high-lighted code listed below to function “static int mt\_probe()”. (Before “hid\_hw\_start”)

```

static int mt_probe(struct hid_device *hdev, const struct hid_device_id *id)
...
/* SiSdrv Start */
if (hdev->vendor == USB_VENDOR_ID_SIS_TOUCH) {
    hdev->quirks |= HID_QUIRK_NOGET;
    printk(KERN_INFO "sis:sis-probe: quirk = %x\n", hdev->quirks);
#ifdef CONFIG_HID_SIS_CTRL
    ret = sis_setup_chardev(hdev);
    if (ret)
        printk( KERN_INFO "sis_setup_chardev fail\n");
#endif //CONFIG_HID_SIS_CTRL
}
/* SiSdrv End */
ret = hid_hw_start(hdev, HID_CONNECT_DEFAULT);
if (ret)
    return ret;

```

#### 2.1.3.4. Finish Function

Copy high-lighted code listed below to function “static void mt\_remove()”. (Before “hid\_hw\_stop”)

```
static void mt_remove(struct hid_device *hdev)
...
/* SiSdrv Start */
if (hdev->vendor == USB_VENDOR_ID_SIS_TOUCH) {
    sis_deinit_chardev(hdev);
}
/* SiSdrv End */
hid_hw_stop(hdev);
```

#### 2.1.3.5. Device list

Copy high-lighted code listed below to structure “hid\_device\_id mt\_devices[]”. (Before “Google MT devices”).

```
static const struct hid_device_id mt_devices[] = {
...
/* SiSdrv Start */
{ .driver_data = MT_CLS_SIS,
  HID_DEVICE(HID_BUS_ANY, HID_GROUP_ANY, USB_VENDOR_ID_SIS_TOUCH,
             HID_ANY_ID) },
/* SiSdrv End */

/* Google MT devices */
{ .driver_data = MT_CLS_GOOGLE,
  HID_DEVICE(HID_BUS_ANY, HID_GROUP_ANY, USB_VENDOR_ID_GOOGLE,
             USB_DEVICE_ID_GOOGLE_TOUCH_ROSE) },
/* Generic MT device */
{ HID_DEVICE(HID_BUS_ANY, HID_GROUP_MULTITOUCH, HID_ANY_ID,
             HID_ANY_ID) },
/* Generic Win 8 certified MT device */
{ .driver_data = MT_CLS_WIN_8,
  HID_DEVICE(HID_BUS_ANY, HID_GROUP_MULTITOUCH_WIN_8,
             HID_ANY_ID, HID_ANY_ID) },
{ }
```

### 2.1.4. Modify Kconfig

Copy high-lighted code listed below and paste it into (kernel\_src)/drivers/hid/**Kconfig**. (After “config HID\_MULTITOUCH”) **Please do not copy and paste whole file directly.**

```
config HID_MULTITOUCH
    tristate "HID Multitouch panels"
    depends on HID
    ---help---
        Generic support for HID multitouch panels.
    ...
#//////////////////// SiSdrv Start //////////////////////

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

menu "SiS touchscreen series"
choice
    depends on USB_HID
    depends on HID_SIS_CTRL
    prompt "SiS controller select"

config HID_SIS95XX_SIS98XX
    depends on HID_SIS_CTRL
    tristate "SiS 95xx and 98xx series Touch Device"
    help
    Support for SiS Touch devices that are fully compliant with HID standard.

config HID_SIS92XX
    depends on HID_SIS_CTRL
    tristate "SiS 92xx series Touch Device"
    help
```



**Support for SiS Touch devices that are fully compliant with HID standard.**

**endchoice**

**config DEBUG\_HID\_SIS\_UPDATE\_FW**

**bool "SiS Touch device update firmware support debug message enable"**

**depends on HID\_SIS\_CTRL**

**default n**

**help**

**Say Y here if you want to enable debug message of  
firmware updating for SiS Touch  
devices.**

**endmenu**

**#////////// SiSdrv End //////////**

### 2.1.5. Modify Makefile

Copy scripts listed below and paste it into (kernel\_src)/drivers/hid/Makefile.

Please do not copy and paste file directly.

```
...
#////////// SiSdrv Start //////////
obj-$(CONFIG_HID_SIS_CTRL) += hid-sis_ctrl.o
#////////// SiSdrv End //////////

obj-$(CONFIG_HID_A4TECH) += hid-a4tech.o
obj-$(CONFIG_HID_ACCUTOUCH) += hid-accutouch.o
```

## 2.2. Kernel configures

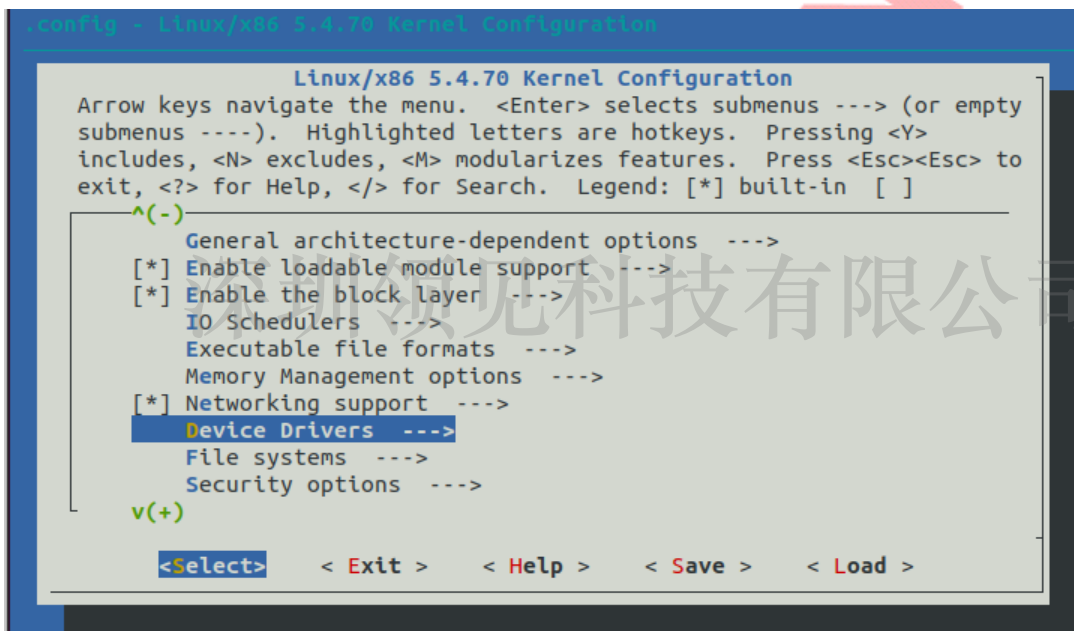
### 2.2.1. Setting configure

Set the configure to building kernel.

And type in command “make menuconfig” to configure kernel, and then include SiS driver with the procedure in the following subsection.

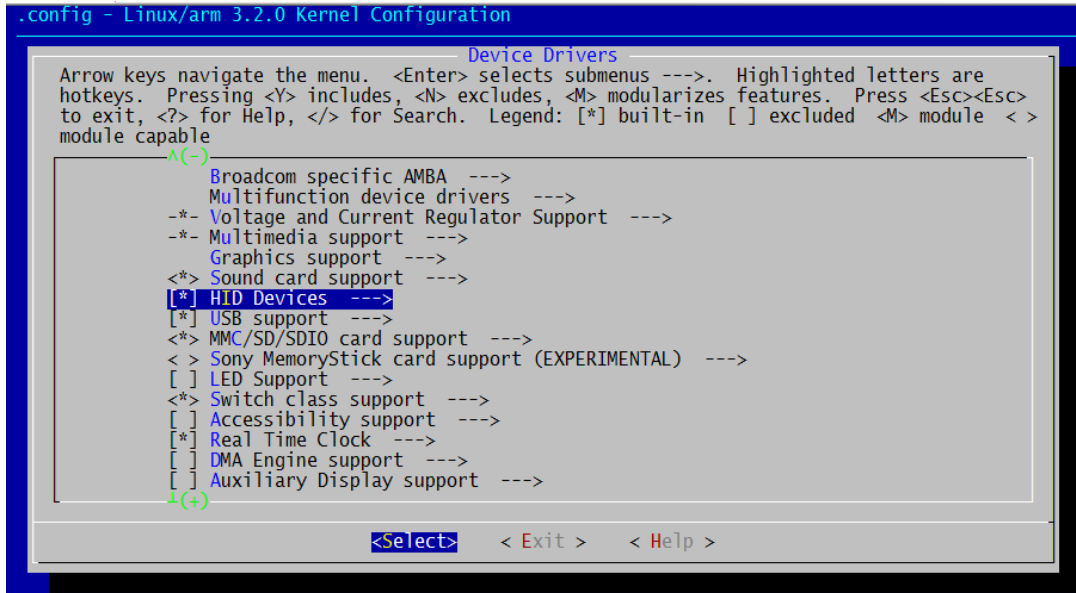
```
cp /boot/config-$(uname -r) .config  
make menuconfig
```

### 2.2.2. Select “Device Drivers”

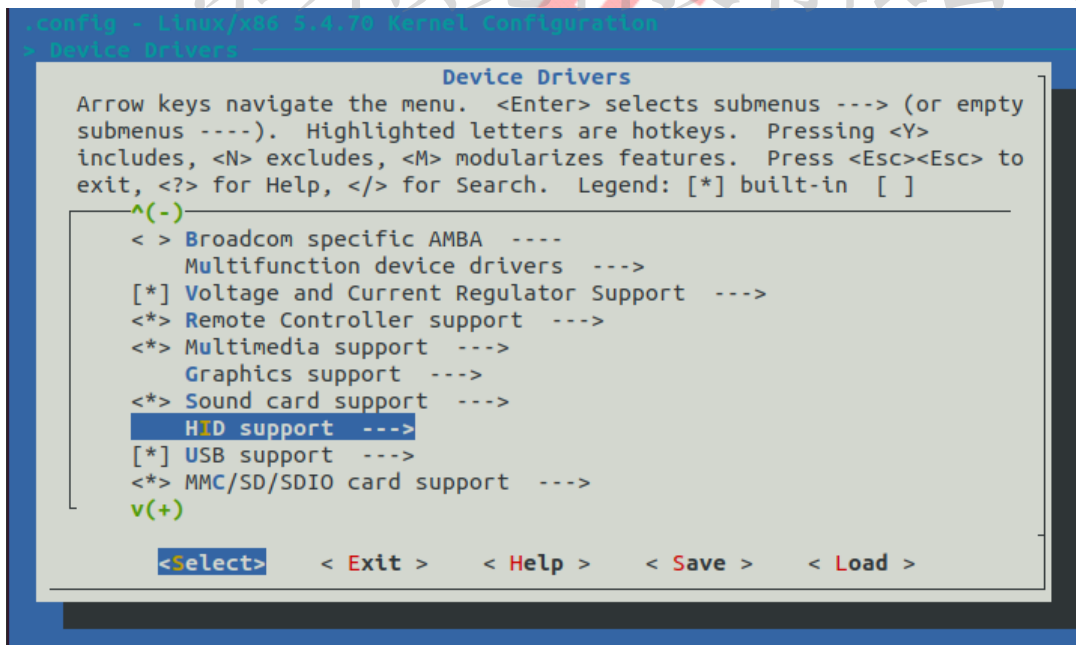


## 2.2.3. Include and select HID Devices (HID support)

If kernel <3.9, needs to include “HID Devices”

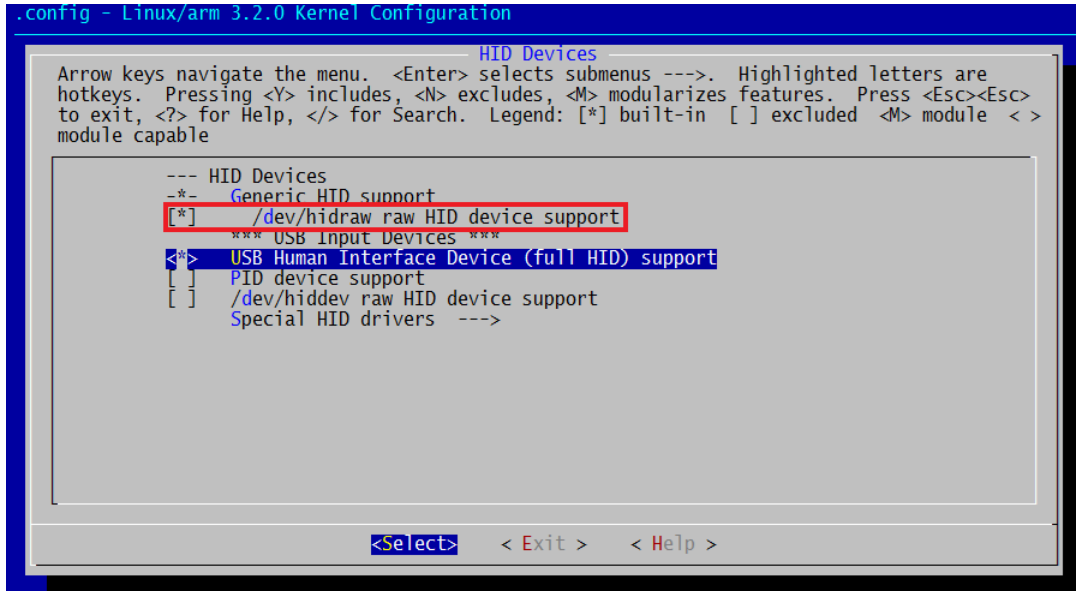


If kernel >= 3.10, select “HID support”

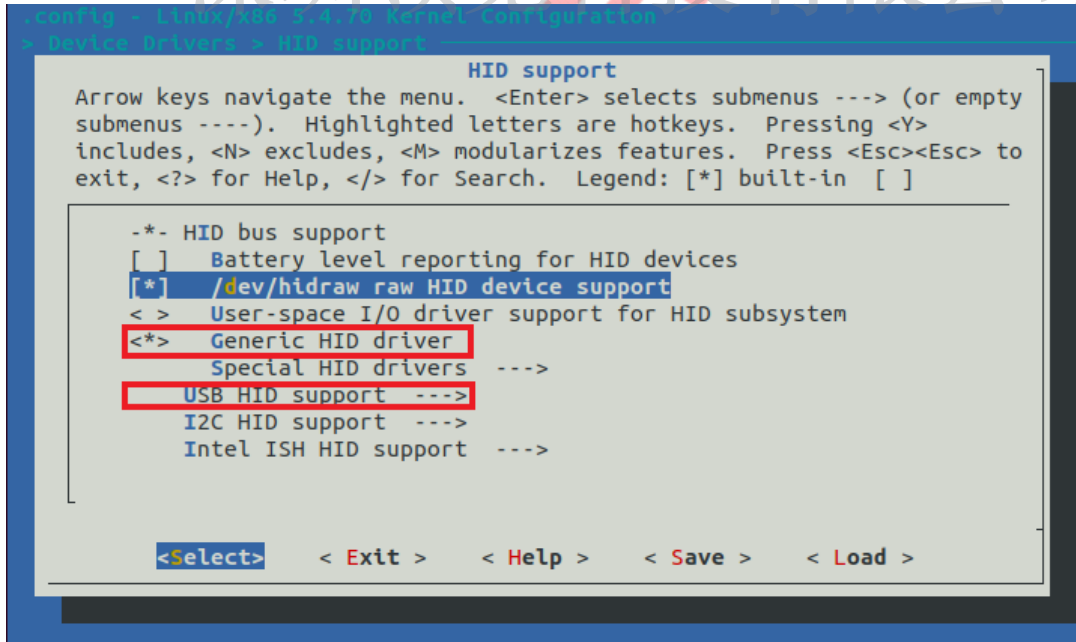


## 2.2.4. Include USB Human Interface Device (full HID) support

If kernel version < 3.9, Please also choose “/dev/hidraw raw HID device support”

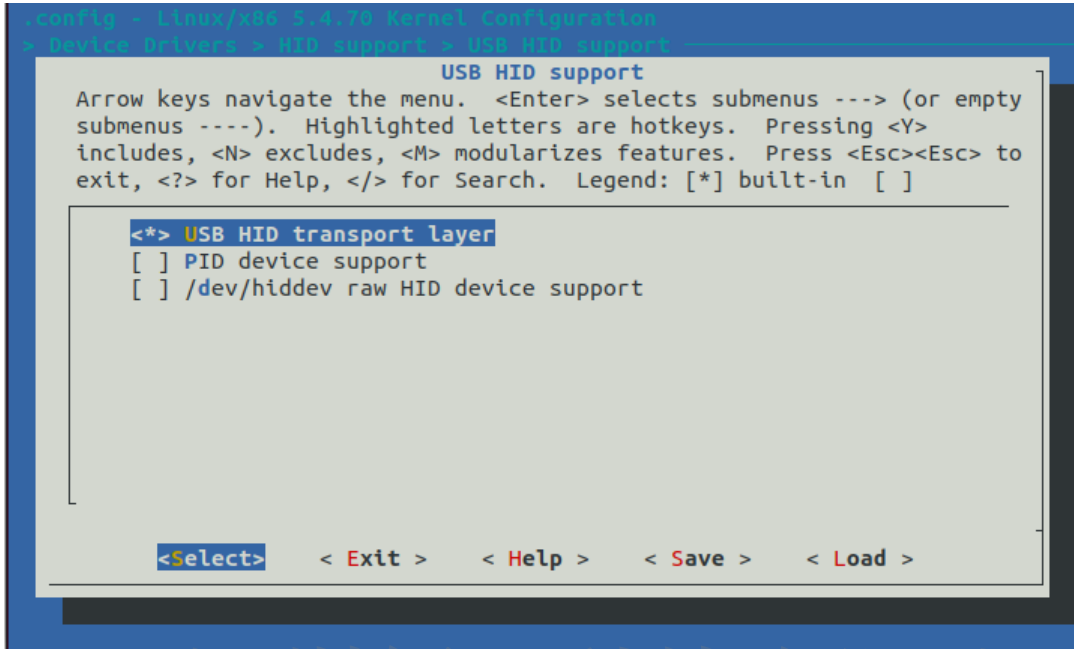


If kernel  $\geq 3.10$ , Please also choose “/dev/hidraw raw HID device support” and “Generic HID driver”. Then select “USB HID support”.

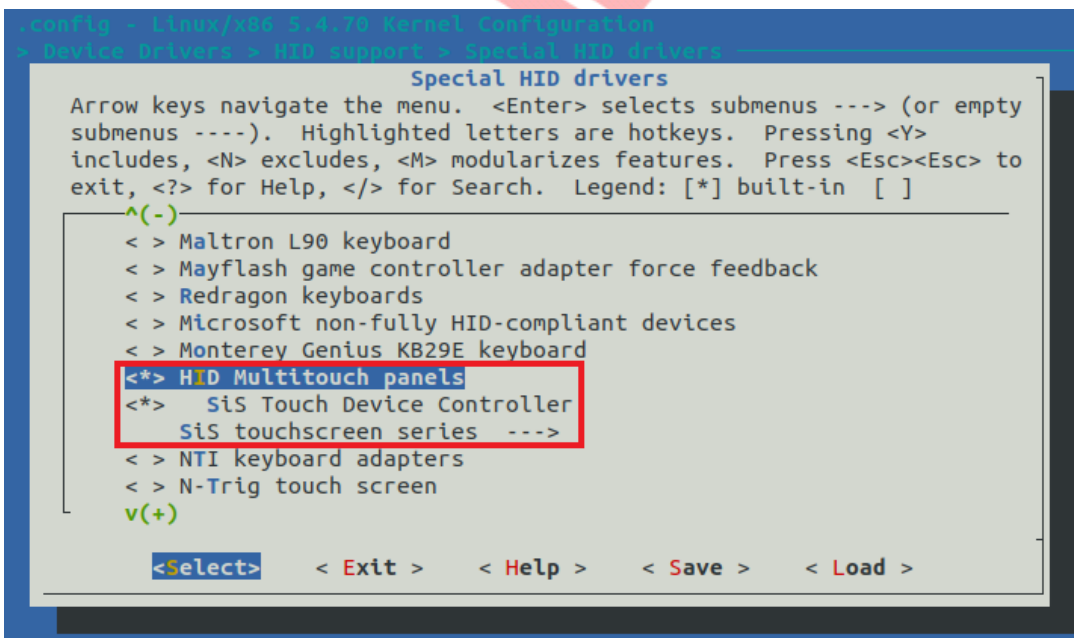


## 2.2.5. USB HID support

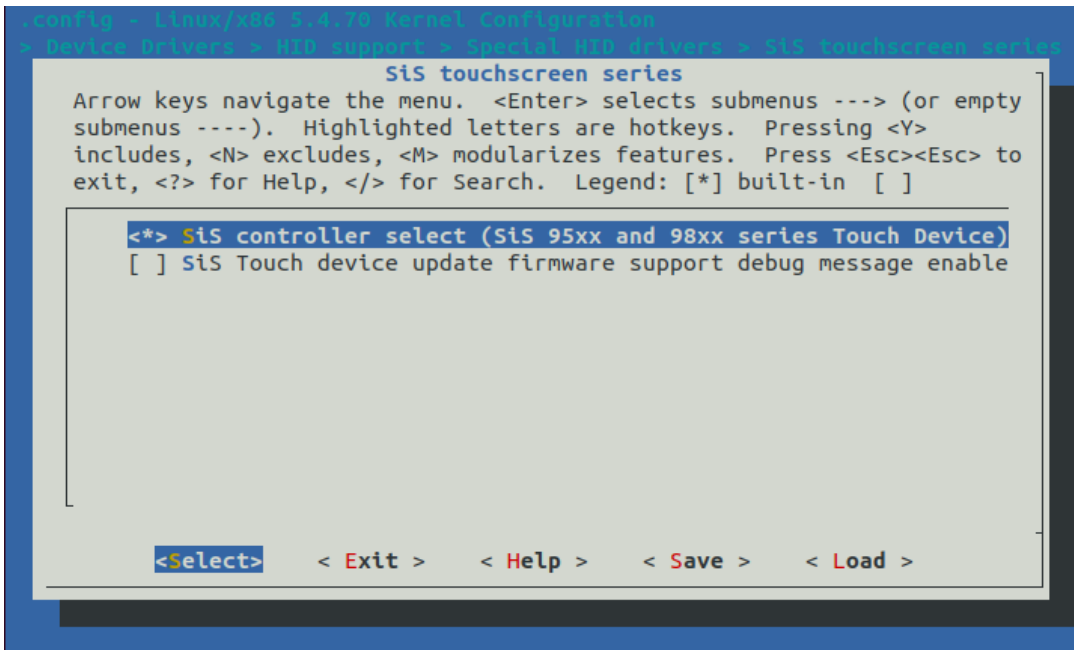
Choose “USB HID transport layer” in USB HID support.



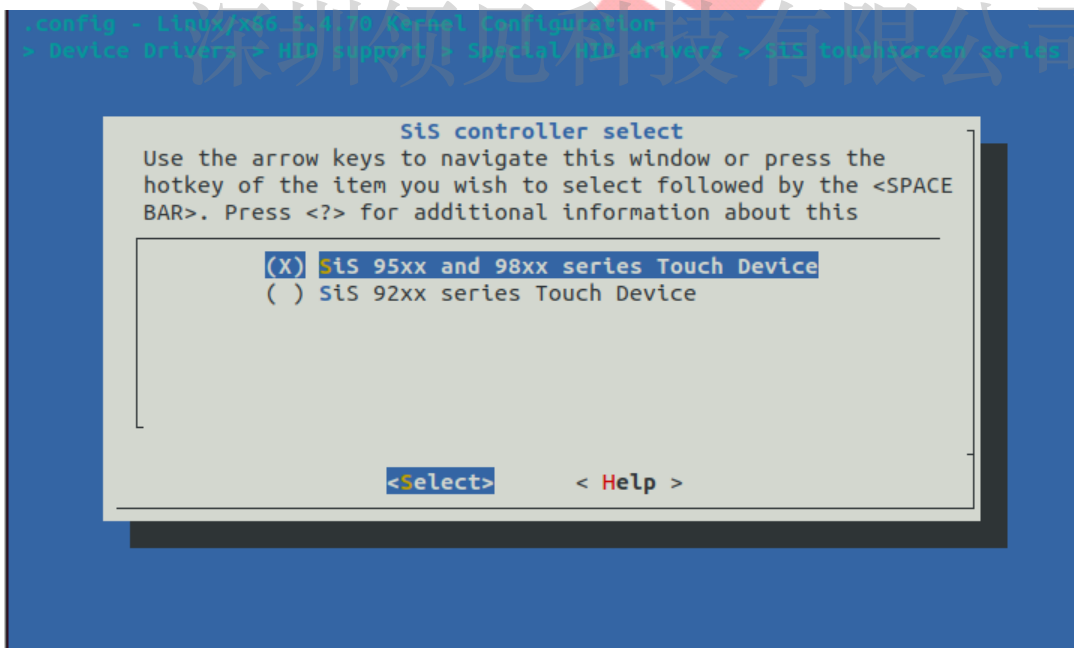
## 2.2.6. Select HID Multitouch panels <\*> and SiS Touch Device Controller <\*>



In SiS touchscreen series:



Select type of SiS controller:



## 2.3. Build kernel image

### 3. Touch driver test

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

#### 3.1. Kernel message (dmesg)

Type command “dmesg > log.txt” to record full kernel message.

```
dmesg > log.txt
```

Type command “dmesg | grep sis” to check sis driver loading.

```
sis@sis-desktop:~$ sudo dmesg | grep sis
[ 0.000000] Linux version 5.11.0-1007-raspi (root@sis-X580VD) (aarch64-linux-
gnu-gcc (Ubuntu 9.3.0-17ubuntu1~20.04) 9.3.0, GNU ld (GNU Binutils for Ubuntu) 2
.34) #7 SMP PREEMPT Tue Jan 4 15:47:41 CST 2022 (Ubuntu 5.11.0-1007.7-raspi 5.11
.12)
[ 3.585428] sis:sis-probe: quirk = 80000848
[ 3.585450] sis_setup_chardev.
[ 3.585467] sis_hydra_hid_touch_device driver(major 236) installed.
[ 8.080140] systemd[1]: Hostname set to <sis-desktop>.
[ 9.170979] systemd[1]: Condition check resulted in Platform Persistent Stora
ge Archival being skipped.
```

#### 3.2. Char device node

Type command “ls -al /dev/sis\*” to check device node and permission.

```
ls -al /dev/sis*
```

If device node exists, you will find the messages below. (for SiS98xx & 95xx)

```
/dev/sis_hydra_hid_touch_device
```

Or (for SiS92xx)

```
/dev/sis_aegis_hid_touch_device
```

### 3.3. lsusb

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

lsusb

```
sis@sis-desktop:~$ lsusb
Bus 003 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 005: ID 04f2:0111 Chicony Electronics Co., Ltd KU-9908 Keyboard
Bus 001 Device 004: ID 046d:c077 Logitech, Inc. M105 Optical Mouse
Bus 001 Device 003: ID 0457:6596 Silicon Integrated Systems Corp. SiS HID Touch Controller
Bus 001 Device 002: ID 2109:3431 VIA Labs, Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
```

### 3.4. USB touch device handlers

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

cat /proc/bus/input/devices

```
sis@sis-desktop:~$ cat /proc/bus/input/devices
I: Bus=0003 Vendor=0457 Product=6596 Version=0111
N: Name="Silicon Integrated System Co. SiS HID Touch Controller"
P: Phys=usb-0000:01:00.0-1.1/input0
S: Sysfs=/devices/platform/scb/fd500000.pcie/pci0000:00/0000:00:00.0/0000:01:00.0/usb1/1-1/1-1.1/1-1.1:1.0/0003:0457:6596.0001/input/input0
U: Uniq=
H: Handlers=mouse0 event0
B: PROP=2
B: EV=1b
B: KEY=400 0 0 0 0 0
B: ABS=2608000000000003
B: MSC=20
```