

EETI eGTouch Linux Programming Guide v2.5e

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Sec 1: Introduction

1.1 GuideLine

EETI provides all kinds of touch solution. EETI eGTouchD is a touch daemon driver for EETI touch controller. Only is available for kernel **2.6.24** upward.

Support interfaces:

1. **USB**
2. **RS232**
3. **PS/2**

Having below features:

1. **Precise points.**
2. **Great calibration precision for Resistive controller.**
3. **Capable for 10+ points report.**
4. **Following Linux Standard Multitouch-protocol point report.**
5. **Rightclick, beep sound, constant touch filter, etc.**
6. **Support multi devices.**
7. **Available for detecting X-window rotation to do rotating coordinate.**
8. **Provide manually modify driver's behavior.**

This document would assist you to install eGTouchD.

1.2 Support From Vendor

If you encounter any problem as running eGTouchD driver, please help us follow the steps described in SEC 7 to collect debug information. Send the information to us and tell us your problem. With useful information we could help you solve the problem faster.

如果你遭遇任何 **driver** 的問題，請參照此文件的 **Sec 7**，取得我們需要的 **Debug** 資訊。將該資訊以及你的問題描述寄給我們，如此我們才能最快地協助你解決問題。

Please send mail to: **touch_fae@eeti.com**

Sec 2: Before install

2.1 Patch kernel module

To install driver, please check module configuration as below:

Necessary:

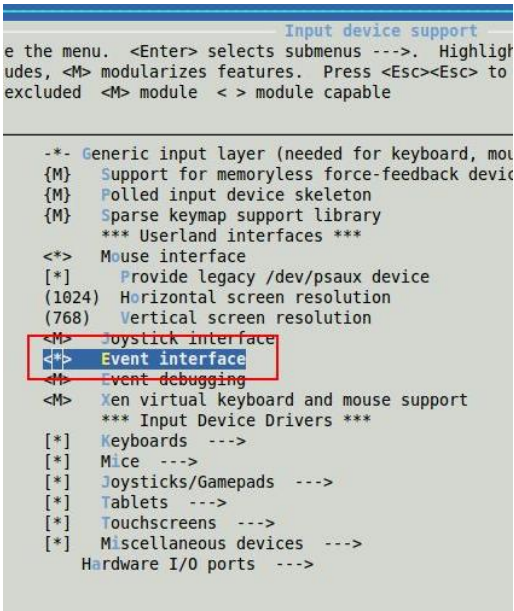
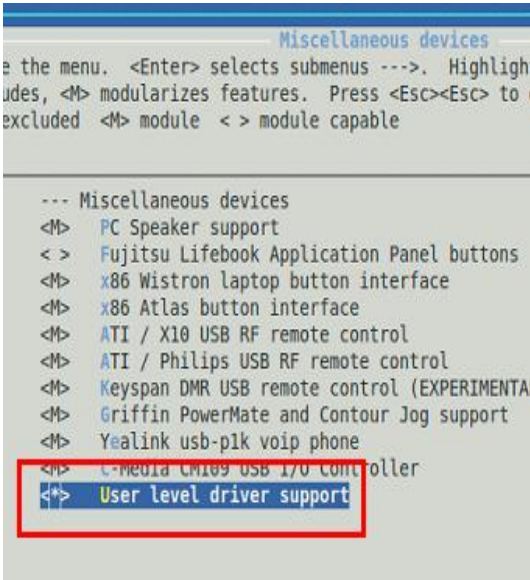
- 1. EVDEV
- 2. UINPUT
- 3. HIDRAW (USB Interface)
- 4. HID_MULTITOUCH (USB Interface & Kernel 3.0 upwards)

Remove:

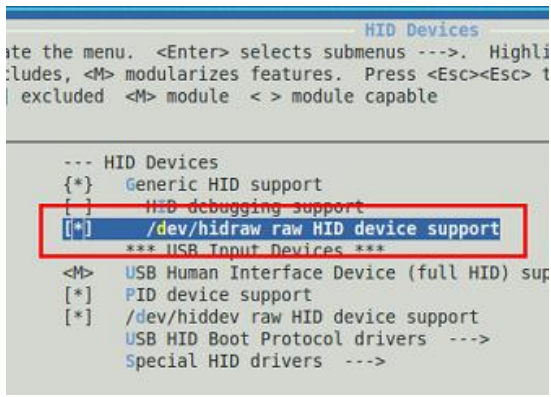
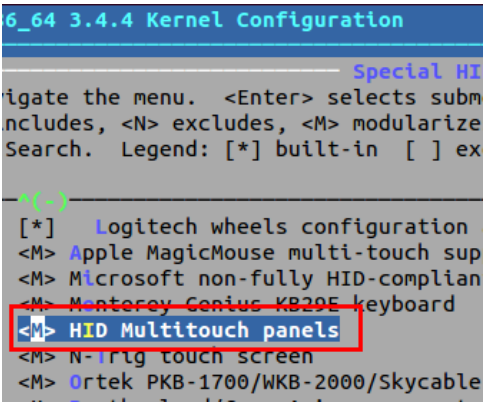
CONFIG_TOUCHSCREEN_USB_COMPOSITE
(USB Interface & PID 0001 controller)

You could check this by “make menuconfig” command or modify Kconfig file. Below is an example of “make menuconfig”:

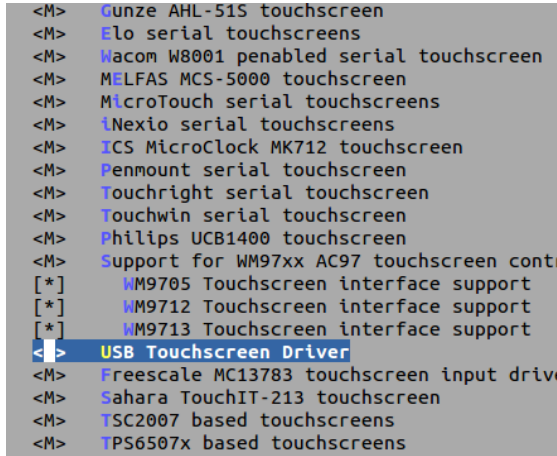
Necessary:

| | |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| [Device Drivers] / [Input device support] / [Event interface] | [Device Drivers] / [Input device support] / [Miscellaneous devices] / [User level driver support] |
|  |  |

Necessary:

| | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| [Device Drivers] / [HID Devices] / [/dev/hidraw raw HID device support] (for USB Interface) | [Device Drivers] / [HID Devices] / Special HID drivers / HID Multitouch panels (If Kernel Version 3.0 upwards & for USB Interface) |
|  |  |

Remove:

| | |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| [Device Drivers] / [Input device support] / [Touchscreens] / [USB Touchscreen Driver] (PID 0001 USB controller) |  |
|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|

2.2 Patch kernel source code

Important! If your system fulfill below two conditions, please refer to **Sec 6-1** to do kernel blacklist patch first, or driver would **NOT** be functional.

| | |
|----|--------------------------------------------------|
| 1. | Interface is using USB |
| 2. | X.org version < 1.8.7 or without X |

2.3 check device

- 1.) If you did above modification, please rebuild your kernel to make it effect.
- 2.) After that, you could check those kernel functions enable or not through below steps.

All interface.

a. UINPUT device node

You should see uinput under **/dev/input/uinput** or **/dev/uinput**.

For example:

```
File Edit View Terminal Help
root@william-desktop:/dev/input# pwd
/dev/input
root@william-desktop:/dev/input# ls uinput -al
crw-rw---- 1 root root 10, 223 2010-01-05 15:43 uinput
root@william-desktop:/dev/input#
```

USB interface only.

b. hidraw device node

As the usb device is plug-in, there would be a **hidraw** node generated under **/dev**

```
File Edit View Terminal Help
root@william-desktop:/dev# pwd
/dev
root@william-desktop:/dev# ls hidraw* -al
crw-rw---- 1 root root 251, 0 2010-01-05 17:02 hidraw0
root@william-desktop:/dev#
```

c. USB touch device handlers

Type command "**cat /proc/bus/input/devices**" and see the result.

If you need and have done the source code patch at section 2.2, you would see a **blank content** behind the **Handlers** item.

```
I: Bus=0003 Vendor=0eef Product=720c Version=0100
N: Name="eGalax Inc. USB TouchController"
P: Phys=usb-0000:00:1d.0-2/input0
S: Sysfs=/devices/pci0000:00/0000:00:1d.0/usb2/2-2/2-2:1.0/input/input7
U: Uniq=
H: Handlers=
B: EV=1b
B: KEY=421 0 30001 0 0 0 0 0 0 0
B: ABS=100 3f
B: MSC=10
```

3-1 Install Process

You could execute script file **setup.sh** to automatically install driver.

Syntax:

```
sh setup.sh          # To install the eGTouch driver.
sh setup.sh uninstall # To remove the eGTouch driver.
```

You could also complete these steps manually.

1. Decompress eGTouch package which contains:
 - a) eGTouchD: a daemon service driver for EETI touch controller.
 - b) eGTouchL.ini: a parameter list loaded by driver
 - c) GetEvent.c: a sample code describes how to read EETI input event.If you have X-window, you may also be available for these:
 - d) eGTouchU: a X-window utility tool for eGTouchD (x86 system only)
 - e) eCalib: a command line X-window calibration tool.
2. Place "eGTouchL.ini" into Linux system directory "/etc/eGTouchL.ini" where driver would load it. We can change driver behavior by modifying this file. **The detail descriptions of parameters are described in Section 5.** (You can see brief definitions in eGTouchL.ini)
3. Place eGTouchD & eGTouchU & eCalib under /usr/bin. Place /usr/bin/eGTouchD execution in /etc/rc.local to make eGTouchD execute at system boot.
4. After launching eGTouchD with device plugged, check **/proc/bus/input/devices** file and you will find two virtual devices. Like below figures:

```
I: Bus=0006 Vendor=0eef Product=0020 Version=0001
N: Name="eGalaxTouch Virtual Device for Multi"
P: Phys=
S: Sysfs=/devices/virtual/input/input13
U: Uniq=
H: Handlers=event10
B: 0000-0
```

```
I: Bus=0006 Vendor=0eef Product=0010 Version=0001
N: Name="eGalaxTouch Virtual Device for Single"
P: Phys=
S: Sysfs=/devices/virtual/input/input14
U: Uniq=
H: Handlers=event11
```

We could check event node which was assigned to the virtual device and read/get input event through this device node, e.g. /dev/input/eventX.

3-2 Tools

As you have **X-window**, these tools are available for use.

Please execute these tools under **“root”** permission!

| | |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| eGTouchU x86 system only | The tool eGTouchU is a utility tool which could help you modify driver's parameter through UI. The detail descriptions please refer to the document “EETI eGTouch Utility Guide” in driver package. |
| eCalib | The tool eCalib is a calibration tool with command line. Please type “eCalib -h” to see the usage content. |

Sec 4: Touch Input Event Sequence

The eGTouchD daemon sends input event through kernel feature UINPUT so that the client program can get these events from /dev/input/eventX.

4-1 Two different event sequences

The eGTouchD daemon would report event based on different kernel version.

1. kernel version is 2.6.36 upwards:

Multi-touch Protocol Type B

```
ABS_MT_SLOT 0
ABS_MT_TRACKING_ID 0
ABS_MT_POSITION_X x[0]
ABS_MT_POSITION_Y y[0]
ABS_MT_SLOT 1
ABS_MT_TRACKING_ID 1
ABS_MT_POSITION_X x[1]
ABS_MT_POSITION_Y y[1]
```

you can see the detailed rule described in /Documentation/input/**multi-touch-protocol.txt** under Linux kernel source code.

2. kernel version is 2.6.35 downwards:

EETI protocol: Standard mouse event and custom extra event

| | |
|---------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Type = EV_KEY Code = BTN_LEFT Value = left mouse button state of first point , 1: pen down / 0: life off. | Type = EV_KEY Code = BTN_EXTRA Value = the touch state of second point , 1: pen down / 0: lift off. |
| Type = EV_ABS | Type = EV_ABS |

| | |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| Code = ABS_X Value = the X axis position of first point . The range is from 0 to 2047. | Code = ABS_RX Value = the X axis position of second point . The range is from 0 to 2047 |
| Type = EV_ABS Code = ABS_Y Value = the Y axis position of first point . The range is from 0 to 2047. | Type = EV_ABS Code = ABS_RY Value = the Y axis position of second point . The range is from 0 to 2047. |
| Type = EV_SYNC Code = SYN_REPORT Value = 0 A Sync report event, all data will be valid after this event is received. | |

4-2 How to read touch event

EETI provide a sample code **GetEvent.c** to show how the event sequence behaves. Please compile the sample code and execute it corresponding to the event node (/dev/input/eventX). You would see the event sequence as panel is touched and design your own application based on this input sequence as well.

Sec 5: eGTouchL.ini Parameter Explanations

The file **eGTouchL.ini** has a parameter list which would be loaded by driver. Driver's behavior could be changed by these parameters. Please **DON'T** modify the front title as setting up eGTouchL.ini.

5-1 Parameter Table

This table describe the detailed usage of all parameters. There is also a simple description in eGTouchL.ini.

| ◆ DebugEnableBits | | Debug message you want to show. |
|---------------------|-----------------------------------------------------|-----------------------------------------------------------------|
| 0 | Close all Debug | |
| 1 | Print initialization debug message [Default] | |
| FFFF | Open all Debug | |
| ◆ ShowDebugPosition | | Position you want to show/store Debug message |
| 0 | Print in file located at /tmp [Default] | |
| 1 | Print in terminal | |
| 2 | Print in above both | |
| ◆ DeviceNums | | How many devices you want to plug-in to the system. If you want |

| | | |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| | | more than one device, please modify this value. |
| 1 | Only one device [Default] | |
| 2-10 | More than one device. [Max = 10] | |
| ◆ Baudrate | | Choose the BaudRate |
| 0 | Auto detect Baudrate [Default] | |
| X | Set Baudrate to X bps. (PCAP: 57600 , Resis: 9600) | |
| ◆ SerialPath | | RS232 Serial Path |
| default | Default path /dev/ttySX (X could be equals to 0-10) [Default] | |
| /dev/serial/ttyS0 | Customized path. Please type in your specific serial path according to the form. | |
| ◆ SupportPoints | | The amount of points you want to report (This is also confined by Controller) |
| 0 | No point | |
| 1 | Single-touch | |
| >=2 | Multi-touch [Default = 5] | |
| ◆ Direction | | Change the X and Y direction |
| 0 | Don't make any invert [Default] | |
| 1 | Invert X | |
| 2 | Invert Y | |
| 3 | Invert both X and Y | |
| 4 | Swap X and Y | |
| ◆ Orientation | | Change the orientation |
| 0 | 0 degree [Default] | |
| 1 | 90 degree | |
| 2 | 180 degree | |
| 3 | 270 degree | |
| ◆ EdgeCompensate | | Do edge compensate |
| 0 | Disable [Default] | |
| 1 | Enable | |
| EdgeLeft, EdgeRight | Edge compensate value | |
| EdgeTop, EdgeBottom | | |
| X | If equals to 100, it means no change. If you set Left=50, you'll see the left-edge points are shrinks inward. And vice versa. [Min 50 - 150 Max] [Default = 100] | |
| ◆ HoldFilterEnable | | Filter out constant touch or not |
| 0 | Disable [Default] | |
| 1 | Enable | |

| | | | | | | | | | | | | | |
|------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---|---|---|--|---|---|---|----------------------------------------------|---|---|
| HoldRange | | Constant touch valid area | | | | | | | | | | | |
| X | ±X range of the point which would lead to constant touch [Min 0 - 50 Max] [Default = 10] | | | | | | | | | | | | |
| ◆ SplitRectMode | | Split the display into Specific Rect. Touch would just show on the specific Rect. | | | | | | | | | | | |
| 0 | No change (Full Display) [Default] | | | | | | | | | | | | |
| 1-8 | Driver in-built split Rect <table><tr><td>2</td><td>1</td><td>5</td><td></td></tr><tr><td>3</td><td>4</td><td>6</td><td><table><tr><td>7</td><td>8</td></tr></table></td></tr></table> | | | 2 | 1 | 5 | | 3 | 4 | 6 | <table><tr><td>7</td><td>8</td></tr></table> | 7 | 8 |
| 2 | 1 | 5 | | | | | | | | | | | |
| 3 | 4 | 6 | <table><tr><td>7</td><td>8</td></tr></table> | 7 | 8 | | | | | | | | |
| 7 | 8 | | | | | | | | | | | | |
| 9 | Customized Rect. | | | | | | | | | | | | |
| CustomRectLeft CustomRectRight CustomRectTop CustomRectBottom | | Theses parameters are valid as SplitRectMode=9. You can customize the Rect by these parameters. | | | | | | | | | | | |
| 0-2047 | Four sides of the customized Rect | | | | | | | | | | | | |
| ◆ DetectRotation (Only for x86 system) | | Enable: Driver would map its coordinate corresponding to X window rotation. *Please see Sec 6-2. Disable: If there's no roation requirement, just disable it. | | | | | | | | | | | |
| 0 | Disable [Default] | | | | | | | | | | | | |
| 1 | Enable | | | | | | | | | | | | |
| ◆ ReportMode | | Set different report type | | | | | | | | | | | |
| 1 | Normal Mode. Report point normally. [Default] | | | | | | | | | | | | |
| 2 | Click on Touch. Only report point as touch down. | | | | | | | | | | | | |
| 3 | Click on Release. Only report point as touch up. | | | | | | | | | | | | |
| ◆ BtnType | | Set EETI protocol BtnType | | | | | | | | | | | |
| 0 | Report single event as BTN_LEFT. [Default] | | | | | | | | | | | | |
| 1 | Report single event as ABS_PRESSURE. (Generally for Tslib) | | | | | | | | | | | | |
| 2 | Report single event as BTN_TOUCH. | | | | | | | | | | | | |
| ◆ RightClickEnable | | Report mouse Right Click after constant touch for a while | | | | | | | | | | | |
| 0 | Disable Right Click | | | | | | | | | | | | |
| 1 | Enable Right Click [Default] | | | | | | | | | | | | |
| RightClickDuration | | Constant touch duration to trigger Right Click | | | | | | | | | | | |
| X | X milliseconds [Default = 1500] | | | | | | | | | | | | |
| RightClickRange | | Valid area of trigger-RightClick constant touch | | | | | | | | | | | |
| X | ±X range of the point would lead to constant touch for RightClick [Min 0 - 50 Max] [Default = 10] | | | | | | | | | | | | |
| ◆ BeepState | | Make a beep sound as touch *Please see Sec 6-3. | | | | | | | | | | | |

| | | |
|------------|----------------------------------------------------------------------------|----------------------------------------------|
| 0 | Disable Beep | |
| 1 | Make a beep sound as "Touch Down" | |
| 2 | Make a beep sound as "Touch Up" | |
| 3 | Make a beep sound as both two above conditions. | |
| BeepDevice | | Choose the beep sound device |
| 0 | No device | |
| 1 | Send beep sound by from system buzzer | |
| 2 | Send beep sound by from sound card (Only for x86 system) | |
| 3 | Send beep sound from both devices. | |
| BeepFreq | | You can modify buzzer beep frequency here. |
| X | (Only for buzzer) The buzzer beep frequency. [Default = 1000] | |
| BeepLen | | You can modify buzzer beep time length here. |
| X | (Only for buzzer) The buzzer beep time length (ms). [Default = 200] | |

Sec 6: Annotation

6-1 Kernel source patch

Please append following **RED** section into your source code.

If your kernel is **2.6.33 downwards**, please follow section **6-1-1**.

If your kernel is **2.6.34 upwards**, please follow section **6-1-2**.

6-1-1 kernel 2.6.33 downwards

1. /SourceCode/drivers/input/**evdev.c**

```
static struct input_device_id evdev_blacklist[] =  
{ /* Added by EETI */  
    {  
        .flags = INPUT_DEVICE_ID_MATCH_BUS | INPUT_DEVICE_ID_MATCH_VENDOR,  
        .bustype = BUS_USB,  
        .vendor = 0x0EEF,  
    },  
    {}, /* Terminating entry */  
};
```

```
static struct input_handler evdev_handler = {  
    .event = evdev_event,  
    .connect = evdev_connect,  
    .disconnect = evdev_disconnect,  
    .fops = &evdev_fops,  
    .minor = EVDEV_MINOR_BASE,  
    .name = "evdev",  
    .id_table = evdev_ids,  
    .blacklist = evdev_blacklist, /* Added by EETI */  
};
```

2. /SourceCode/drivers/input/mousedev.c

```
static struct input_device_id mousedev_blacklist[] =
{
    /* Added by EETI */
    {
        .flags = INPUT_DEVICE_ID_MATCH_BUS | INPUT_DEVICE_ID_MATCH_VENDOR,
        .bustype = BUS_USB,
        .vendor = 0x0EEF,
    },
    {
        .flags = INPUT_DEVICE_ID_MATCH_BUS | INPUT_DEVICE_ID_MATCH_VENDOR,
        .bustype = BUS_VIRTUAL,
        .vendor = 0x0EEF,
    },
    {}, /* Terminating entry */
};
```

```
static struct input_handler mousedev_handler = {
    .event = mousedev_event,
    .connect = mousedev_connect,
    .disconnect = mousedev_disconnect,
    .fops = &mousedev_fops,
    .minor = MOUSEDEV_MINOR_BASE,
    .name = "mousedev",
    .id_table = mousedev_ids,
    .blacklist = mousedev_blacklist, /* Added by EETI */
};
```

3. /SourceCode/drivers/input/joydev.c

```
static const struct input_device_id joydev_blacklist[] =
{
    {
        .flags = INPUT_DEVICE_ID_MATCH_EVBIT | INPUT_DEVICE_ID_MATCH_KEYBIT,
        .evbit = { BIT_MASK(EV_KEY) },
        .keybit = { [BIT_WORD(BTN_TOUCH)] = BIT_MASK(BTN_TOUCH) },
    },    /* Avoid itouchpads and touchscreens */
    {
        .flags = INPUT_DEVICE_ID_MATCH_EVBIT | INPUT_DEVICE_ID_MATCH_KEYBIT,
        .evbit = { BIT_MASK(EV_KEY) },
        .keybit = { [BIT_WORD(BTN_DIGI)] = BIT_MASK(BTN_DIGI) },
    },    /* Avoid tablets, digitisers and similar devices */
    {
        .flags = INPUT_DEVICE_ID_MATCH_BUS | INPUT_DEVICE_ID_MATCH_VENDOR,
        .bustype = BUS_VIRTUAL,
        .vendor = 0x0EEF,
    },    /* Added by EETI */
    { }    /* Terminating entry */
};

static struct input_handler joydev_handler = {
    .event = joydev_event,
    .connect = joydev_connect,
    .disconnect = joydev_disconnect,
    .fops = &joydev_fops,
    .minor = JOYDEV_MINOR_BASE,
    .name = "joydev",
    .id_table = joydev_ids,
    .blacklist = joydev_blacklist,
};
```

1. /SourceCode/drivers/input/**evdev.c**

```
static bool evdev_match(struct input_handler *handler, struct input_dev *dev)
{
    /* Avoid EETI USB touchscreens */
    #define VID_EETI 0x0EEF
    if ((BUS_USB == dev->id.bustype) && (VID_EETI == dev->id.vendor))
        return false;
    return true;
}
```

```
static struct input_handler evdev_handler = {
    .event = evdev_event,
    .match = evdev_match, /* Added by EETI */
    .connect = evdev_connect,
    .disconnect = evdev_disconnect,
    .fops = &evdev_fops,
    .minor = EVDEV_MINOR_BASE,
    .name = "evdev",
    .id_table = evdev_ids,
};
```

2. /SourceCode/drivers/input/**mousedev.c**

```
static bool mousedev_match(struct input_handler *handler, struct input_dev *dev)
{
    /* Avoid EETI USB touchscreens */
    #define VID_EETI 0x0EEF
    if ((BUS_USB == dev->id.bustype) && (VID_EETI == dev->id.vendor))
        return false;
    /* Avoid EETI virtual devices */
    if ((BUS_VIRTUAL == dev->id.bustype) && (VID_EETI == dev->id.vendor))
        return false;
    return true;
}
```

```
static struct input_handler mousedev_handler = {
    .event = mousedev_event,
```

```

        .match = mousedev_match, /* Added by EETI */

        .connect = mousedev_connect,
        .disconnect = mousedev_disconnect,
        .fops = &mousedev_fops,
        .minor = MOUSEDEV_MINOR_BASE,
        .name = "mousedev",
        .id_table = mousedev_ids,
};

```

3. /SourceCode/drivers/input/joydev.c

```

static bool joydev_match(struct input_handler *handler, struct input_dev *dev)
{
    /* Avoid touchpads and touchscreens */
    if (test_bit(EV_KEY, dev->evbit) && test_bit(BTN_TOUCH, dev->keybit))
        return false;

    /* Avoid tablets, digitisers and similar devices */
    if (test_bit(EV_KEY, dev->evbit) && test_bit(BTN_DIGI, dev->keybit))
        return false;

    /* Avoid EETI virtual devices */
    #define VID_EETI 0x0EEF
    if ((BUS_VIRTUAL == dev->id.bustype) && (VID_EETI == dev->id.vendor))
        return false;

    return true;
}

static struct input_handler joydev_handler = {
    .event = joydev_event,
    .match = joydev_match,
    .connect = joydev_connect,
    .disconnect = joydev_disconnect,
    .fops = &joydev_fops,
    .minor = JOYDEV_MINOR_BASE,
    .name = "joydev",
    .id_table = joydev_ids,
};

```


Sec 7: Need Support From EETI

If you encounter any problem as running eGTouchD driver, please help us follow below steps to collect debug information and tell us the symptom you met. With these information we could solve the problem faster. Please send to this mail: **touch_fae@eeti.com**

7-1 Environment Information

Please fill in this chart as much as you could. These would help us clarify the environment.

If you're not sure or don't know about it. You could just keep it blank.

| | |
|---------------------------------------------------|--|
| 1. CPU type | |
| 2. Kernel version | |
| 3. Linux Distribution and Version. | |
| 4. If having X-window, X version? (X --version) | |
| 5. If no X-window, what's your GUI system? (QT?) | |
| 6. Controller Interface | |
| 7. Controller Type (PCAP or Resistive or Else) | |
| 8. Controller Model, Version | |

7-2 Register input devices

1. Execute command `cat /proc/bus/input/devices`
2. Send us the output result.

7-3 Driver debug log

1. Modify file eGTouchL.ini. Change the value of the parameter DebugEnableBits from 1 to FFFFF. Change the value of ShowDebugPosition from 1 to 0.

As below

```
[eGTouchL.ini]
DebugEnableBits      FFFFF
ShowDebugPosition    0
```

2. Reboot your system. After rebooting, please touch four corner of the touch panel.
3. The log file would be printed in /tmp/eGTouch_[year]_[date]_[time]
4. You may see numerous logs named eGTouch_[year]_[date]_[time]. Please send us the Newest one for analyzing. Thanks.