EETI eGTouch Android Guide v2.5g

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Sec 1: Introduction

EETI provides all kinds of touch solution. EETI eGTouch is a touch daemon driver for EETI touch controller. Support USB & RS232 interface. Available for Android 2.1 upward and 4.0 as well. This document would assist you to install eGTouch and describe eGTouch feature in detail.

If you encounter any problem as running eGTouchD driver, please help us follow the steps described in SEC 6 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.
Technical support and any question: **touch_fae@eeti.com**

Sec 2: Before install

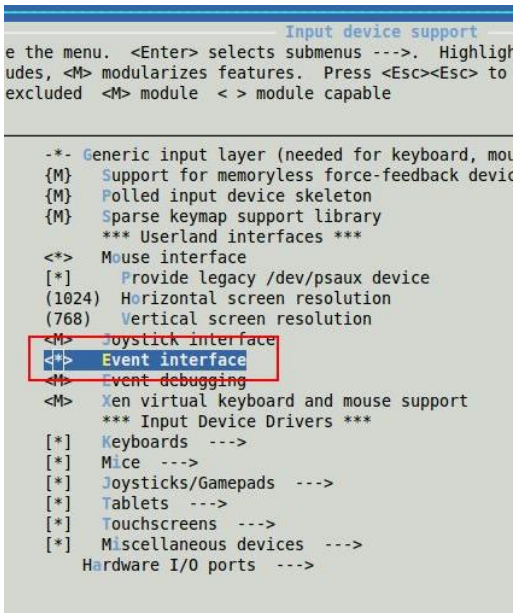
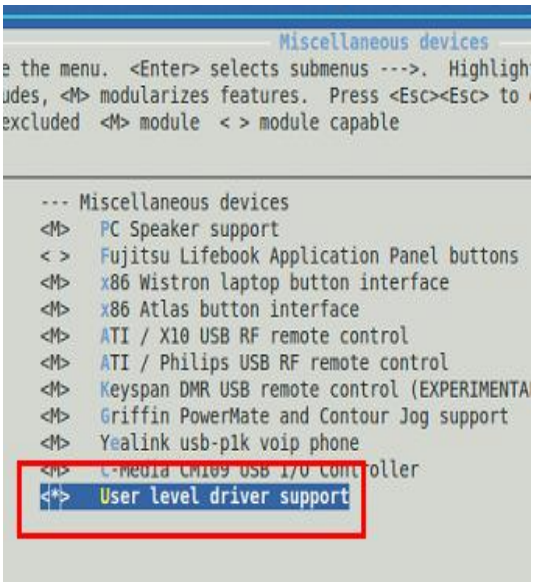
2.1 Patch kernel module

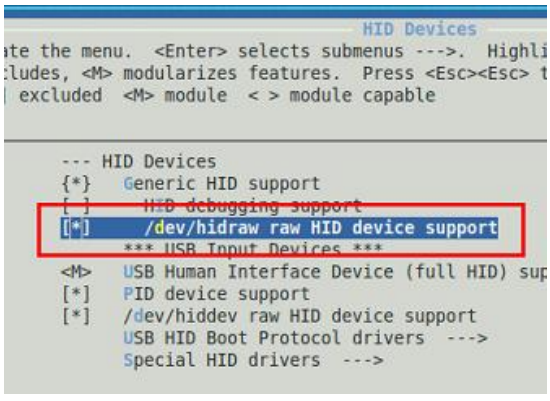
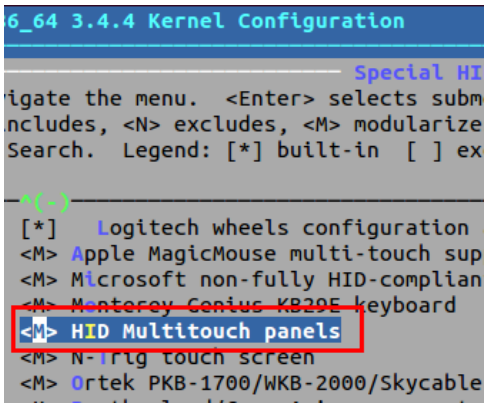
Before installing the driver, we need below kernel modules support:

1. **CONFIG_INPUT_EVDEV**
2. **CONFIG_INPUT_UINPUT**
3. **CONFIG_HIDRAW (for USB Interface)**
4. **HID_MULTITOUCH (USB Interface & Kernel 3.0 upwards)**

Please make sure to these modules are enabled. Users could check this by command `make menuconfig` or modify config file manually.

2.1.a make menuconfig

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

[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)**
	

2.1.b manually modify config file

In some specific Android bsp, `make menuconfig` is invalid for setting kernel config. In this case, we'll advise to set those kernel config by directly modifying the config file. You could see many kernel config files under this path:

/Your_Android_bsp/kernel/arch/arm/configs/

Please select the file relevant to your platform model. For example, if you're using "tegra harmony" platform, the file name would be "**tegra_harmony_android_defconfig**".

Find out the config file based on that rule and modify the file manually. Make sure necessary items are set correctly as below:

CONFIG_INPUT_EVDEV=y

CONFIG_INPUT_UINPUT=y

CONFIG_HIDRAW=y

CONFIG_HID_MULTITOUCH=m

2.2 Patch kernel source code

If you're **NOT** using **USB** interface, you could **SKIP** this part.

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

If your kernel is **2.6.33 downwards**, please follow section **2.2.a.**
If your kernel is **2.6.34 upwards**, please follow section **2.2.b.**

2.2.a 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,
};
```

2.2.b kernel 2.6.34 upwards

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 = ousedev_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,
};
```

2.2.c Kernel 3.8 to 3.12

Important! Before install driver, if your system fulfill below two conditions, please patch kernel hid-core.c first, or driver would NOT be functional.

1.	**Interface is USB**
2.	**Kernel Version is 3.8.x to 3.12.x**
3	**Resistive or SCAP controller**

If your Linux kernel version is **3.8** to **3.12**, using **resistive** or **SCAP** touch controller, please comment the following **RED** section in your source code.

/SourceCode/drivers/hid/hid-core.c

```
bool hid_ignore(struct hid_device *hdev)
{
   …
   switch (hdev->vendor) {
        …
        /*case USB_VENDOR_ID_DWAV:*/
            /* These are handled by usbtouchscreen. hdev->type is probably
             * HID_TYPE_USBNONE, but we say !HID_TYPE_USBMOUSE to match
             * usbtouchscreen. */
             /*if ((hdev->product == USB_DEVICE_ID_EGALAX_TOUCHCONTROLLER ||
                  hdev->product == USB_DEVICE_ID_DWAV_TOUCHCONTROLLER) &&
                  hdev->type != HID_TYPE_USBMOUSE)
                      return true;
              break;*/
        …
   }
   …
}
```

2.3 check device

Please make sure these check items are passed, if not so, the driver would not be executed successfully.

1.) After patching kernel, build new kernel and reboot for taking effect on changes.

2.) Check uninput functions enable or not

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-r----- 1 root root 10, 223 2010-01-05 15:43 uinput root@william-desktop:/dev/input#

3.) If interface is **USB**. After plug in an USB device, check below functions.

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#
USB touch device handlers
Type command "**cat /proc/bus/input/devices**" and see the result. If you need and have done the kernel 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

Sec 3: Install Process

This section describes how to install eGTouch into Android. Before following this, please make sure referring to "**Section 2 Patch Kernel**" to rebuild kernel for supporting necessary features.

1. EETI eGTouch package contains:
   a) eGTouchD: a daemon service driver for EETI touch controller.
   b) eGTouchA.ini : a parameter list could be loaded by driver
   c) eGalaxTouch_VirtualDevice.idc: a file necessary for Android 3.0 upwards
   d) eGalaxCalibrator: a tool provides calibration and line drawing.

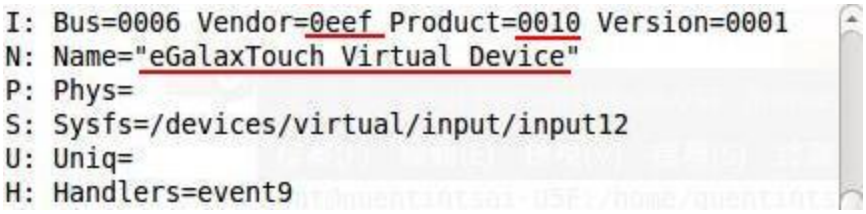
2. Place "eGTouchA.ini" into Android system directory "/data/eGTouchA.ini" where driver would load it. We can change driver behavior by modifying this file. **The detail descriptions of parameters are described in Section 5.** (You can see brief definitions in eGTouchA.ini)

3. To make eGTouchD driver run from the beginning of system operation. Please put eGTouchD driver into Android system directory "/system/bin". Modify the file "**init.rc**" in Android system and add service:

Below Android **4.0**	**service eGTouchD /system/bin/eGTouchD** **user root** **group root** **oneshot**
Above Android **4.0**	**service eGTouchD /system/bin/eGTouchD** **class main** **user root** **group root** **oneshot**

4. [Android 3.0 upwards] Please put file “eGalaxTouch_VirtualDevice.idc” into Android system directory "/system/usr/idc/".

5. After launching eGTouchD, check **/proc/bus/input/devices** file and we will find a virtual devices called “eGalaxTouch Virtual Device”. Information like below figure:



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.

6. If in item 5, the virtual device is not generated, please check whether there is hidraw generated under /dev/ directory as plug-in the device. If not, this may cause by invalid kernel patch, please do kernel patch based on Sec 2.1.b.

Sec 4: Calibration Tool

If you're using the "**PCAP controller**", please **SKIP this section** and **DO NOT install** this calibration tool. The PCAP controller doesn't need to do any calibration.

4-1 USB interface

Please install the tool **eGalaxCalibrator.apk** under the **/CalibrationTool/USB/** directory.

4-2 RS232 interface

Please install the tool **eGalaxAutoCalib.apk** under the **/CalibrationTool/UART/** directory.

As the calibration couldn't work properly, please contact EETI touch_fae@eeti.com for technical support.

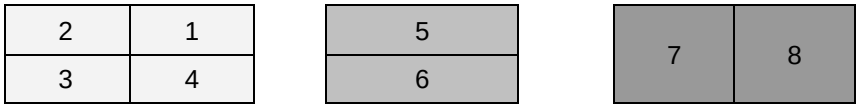
Sec 5: eGTouchA.ini Parameter Explanations

The file **eGTouchA.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 eGTouchA.ini.

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

◆ DebugEnableBits	Debug message you want to show.
0	Close all Debug
1	Print initialization debug message **[Default]**
FFFFF	Open all Debug
◆ ShowDebugPosition	Position you want to show/store Debug message
0	Print in file located at /data/
1	Print in logcat **[Default]**
2	Print in above both
◆ Baudrate	Choose the BaudRate
0	Auto detect Baudrate **[Default]**
X	Set Baudrate to X bps. (PCAP: 57600 , Resis: 9600)
◆ ScanInterface	Choose scan interface
0	Scan all interface **[Default]** (USB / RS232 / PS/2)
1	Scan USB interface only.
2	Scan UART interface only.
3	Scan PS/2 interface only.
◆ SerialPath	RS232 Serial Path

default /dev/serial/ttyS0	Default path /dev/ttySX (X could be equals to 0-10) **[Default]** Customized path. Please type in your specific serial path accordinating to the form.
◆ DeviceNums	How many devices you want to plug-in to the system. If you want more than one device, please modify this value.
1 2-10	Only one device **[Default]** More than one device. **[Max = 10]**
◆ SupportPoints	The amount of points you want to report (This is also confined by Controller)
0 1 >=2	No point Single-touch Multi-touch **[Default = 5]**
◆ Direction	Change the X and Y direction
0 1 2 3 4	Don't make any invert **[Default]** Invert X Invert Y Invert both X and Y Swap X and Y
◆ Orientation	Change the orientation
0 1 2 3	0 degree **[Default]** 90 degree 180 degree 270 degree
◆ EdgeCompensate	Do edge compensate
0 1	Disable **[Default]** Enable
EdgeLeft, EdgeRight EdgeTop, EdgeBottom	Edge compensate value
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 1	Disable **[Default]** 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 1-8 9	No change (Full Display) **[Default]** Driver in-built split Rect  Customized Rect.
CustomRectLeft CustomRectRight CustomRectTop CustomRectBottom	Theses parameters are valid as SplitRectMode=9. You can customize the Rect by these parameters.
0-4095	Four sides of the customized Rect
◆ VKEYEnable	Enable this option if there's virtual key on your touch sensor.
0 1	Disable **[Default]** Enable
VKEYReportMod	Virtual Key Sensitivity.
X	Smaller value means more sensitive. On the other hand, larger is less sensitive.
VKEY_**X** **Y**	1. The value of **X** refer to the vkey package **reported by controller** as touching the specified virtual key on your sensor. 2. The value of **Y** refer to the **keyevent code in input.h** which you want to report to system. You can choose the keyevent you want and fill in the code.
Example A: **VKEY_0** **139**	1. As controller report vkey package [0], we'll send keyevent code [139] to system. 2. The event code [139] in input.h refers to MENU_KEY. Note: 139 is a decimal number.
Example B: **VKEY_1** **0x160**	1. You can fill in Hex number in **Y** by adding a symbol [0x] before the number. 2. As controller report vkey package [1], we'll send keyevent code [0x160] to system 3. The event code [0x160] in input.h refer to KEY_OK.
Note: If you're not sure controller's vkey package value, please contact EETI vendor.	

Sec 6: Technical Support

If you encounter any problem as running eGTouchD driver, please help us follow below steps to collect debug information. Send those information to us and tell us your problem. With these information we could help you solve the problem faster.

Technical support and any question: **touch_fae@eeti.com**

Please provide us below information and the description of the problem you encountered for us.

6-1 Environment Information

Fill in this chart

1. CPU type	
2. Kernel version	
3. Android version.	
4. Touch Controller Interface	
5. Touch Controller Type	

6-2 Register input devices

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

6-3 Driver debug log

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

As below

```
[eGTouchA.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 /data/eGTouch_[year]_[date]_[time]
4. You may see one more log named eGTouch_[year]_[date]_[time]. Please send us the Newest one for analyzing. Thanks.