TouchKit

TouchScreen Controller
User Guide

for Windows CE

Contents

Chapter 1

Touch Panel Controller

This touch panel controller provides the optimistic performance of analog resistive touch panels for 4 wire, 5 wire and 8 wire models. It communicates with PC system directly through RS232, PS/2 and USB connectors. Users can see how superior the design is in sensitivity, accuracy and friendly operation. The touch panel driver emulates mouse left and right button function and supports operation systems including Microsoft Windows 95/ 98/ ME/ NT4/ 2000/ XP/ XP Tablet PC Edition, windows CE 2.12/ 3.0/ .NET, Linux, iMac and DOS.

Controller

Table 1. Controllers match with different interfaces

Interface	RS232	USB	PS/2
4 Wire	O	O	O
5 Wire	O	O	O
8 Wire	O	O	O
Capacitive	O	O	X

Specifications and features

Table 2. Specifications for *TouchKit* controller

Specifications	
Power requirements	+5VDC (Max. 100mA, typical 70mA, 50mV peak to peak maximum ripple)
Operating temperature	0 to 50 degrees centigrade
Storage temperature	-40 to 80 degrees centigrade
Relative humidity	95% at 60 degrees centigrade
Protocol	RS232 model: 9600 bauds, none parity, 8 data bits and 1 stop bit USB model: USB 1.1 low speed PS/2 model: PS/2 mouse
Resolution	2048 x 2048
Report Rate	RS232 model: max. 160 points/ sec USB model: max. 160 points/ sec PS/2 model: max. 140 points/ sec
Response time	Resistive: max. 35 ms Capacitive: max. 20 ms
Pin out definition	4 wire model: X+, Y+, X-, Y- 5 wire model: UL, UR, COM, LR, LL 8 wire model: X+, X+ref, Y+, Y+ref, X-, X-ref, Y-, Y-ref
Panel resistance	4, 8 wire resistive model: 200 ~ 900 ohm (pin to pin on the same layer) 5 wire resistive model: 50 ~ 200 ohm (pin to pin on drive layer)
Regulatory approvals	FCC-B, CE

Table 3. Features for *TouchKit* software

Features	
Calibration	Fast full oriental 4 points position
Compensation	Accuracy 25 points linearity compensation
Draw test	Position and linearity verification
Extend features	1. Support monitor / display rotation 2. Support multiple monitor / display 3. Support QVGA and Half-VGA function 4. Support edge compensation
Controller setting	1. Support multiple controllers 2. Dynamical add / remove controllers 3. Change controller interface without reboot
Language	Support 10 languages for Windows
Mouse emulator	1. Right / Left button emulation 2. Normal / Click on touch / Click on release mode 3. Auto right button
Sound notification	1. Sound option (no sound / touch down / lift up) 2. Frequency adjustment 3. Duration adjustment
Double click	1. Configurable double click speed 2. Configurable double click area
OS support	1. Windows 95 / 98 / ME / NT4 / 2000 / XP / Windows XP Tablet PC Edition 2. Windows CE 2.12 / 3.0 / .NET 3. Linux 4. iMac / OS X 5. MS-DOS Support display resolution: 320x200, 640x200, 640x350, 640x480, 800x600, 1024x768, 1280x1024
COM port support	1. Support COM1 ~ COM256 for Windows and Linux 2. Support COM1 ~ COM8 for DOS

Chapter 2

Installation and Using TouchKit

TouchKit

TouchKit is software, which contains drivers of the touch panel controllers for the specified communication connectors for RS232 and USB and Windows CE operation system, and the other utilities:

◆ **Right button support**

This is utility for emulating the right and left button of mouse.

◆ **Configuration support**

The calibration and draw test of touch panel are done by this utility.

Windows CE 2.12/ 3.0

Steps of installation

There are total five files in the *TouchKit* for Windows CE directory. Please follow these steps to install *TouchKit* for Windows CE.

TouchKit.dll	-driver
Touch32ex.dll	- specific dynamic linking library
TouchTray.exe	- right mouse support
TouchKit.exe	- configuration utility
TouchKit.reg	- information that will be added to registry

1. Make sure that Windows CE has the driver of serial ports.

2. While building Windows CE, users have to assign **TouchKit.dll**, **Touch32ex.dll**, **TouchTry.exe** and **TouchKit.exe** to appropriate directory.

Note: TouchTray.exe is the file of Right Mouse Utility. It has to be started with computer booting. Therefore, put this file to appropriate directory to satisfy this specific request.

3. Add some registry value as the content of **TouchKit.reg**.

4. Now, build Windows CE with this touch panel driver and utilities.

Now, users can boot this Windows CE version on specific device. The right mouse button utility will be emulated while computer booting and the touch panel driver is also ready.

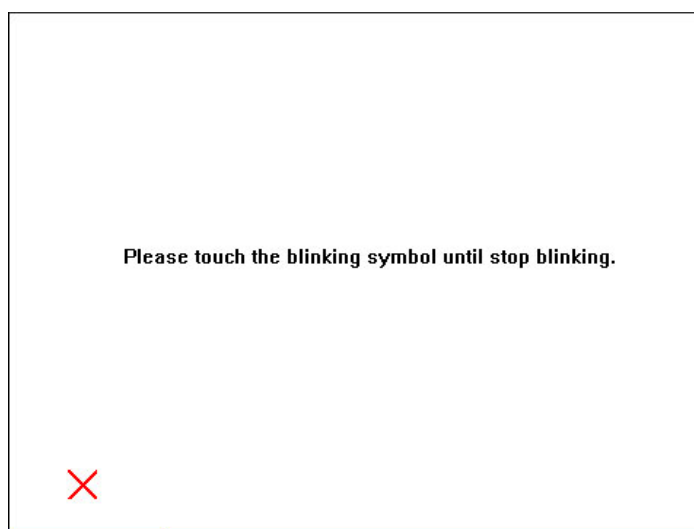## Configuration Utility and Right Button Emulator

Run TouchKit.exe file to execute it.

There are six functions, which are **[Calibrate 4pt]**, **[Draw Test]**, **[Clear CalParam]**, **[Calibrate 25pt]**, **[Right Button]** and **[Quit]**.
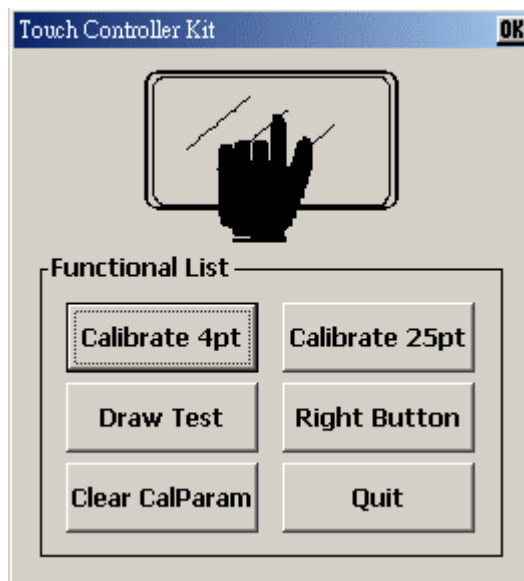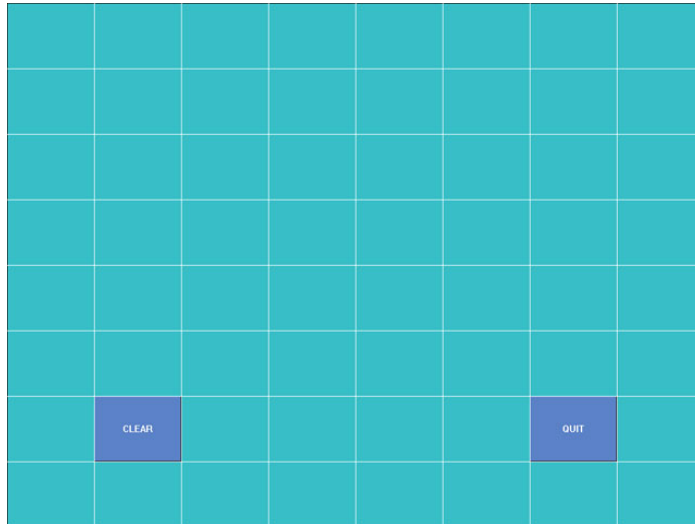

[Calibrate 4pt]

Correct 4-point locations on screen with the panel. Press **[Calibrate 4pt]**, screen displays as follows.

[Draw Test]

Test the drawing position related to the display screen on panel. Click **[Draw Test]** button, and then there will be a squared blue display showing.
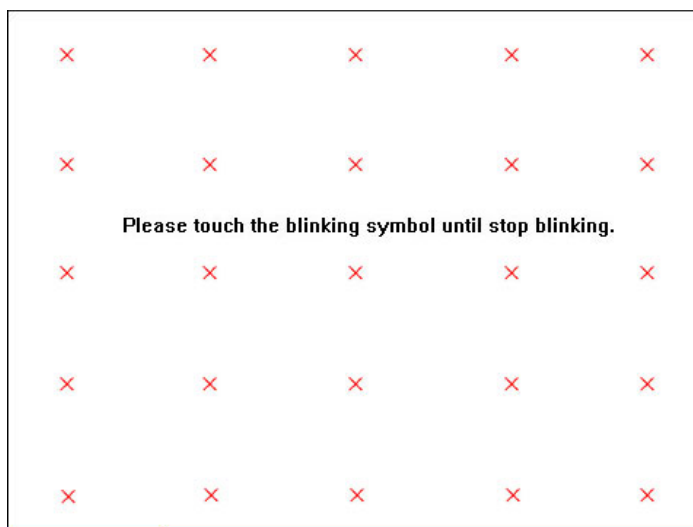

In testing, users can click [Clear] and [Quit] to clear and quit the test.

[Clear CalParam]

Press **[Clear CalParam]** to clear the previous calibration records.

[Calibrate 25pt]

Press **[Calibrate 25pt]** to do 25 points calibration. Correct 25-point locations on screen with the panel.

[Right Button]

Right button emulator has been set **on** for the default value. Click **[Right Button]** to close the right mouse emulator. Right button starts with the computer booting. An icon is located at the right-bottom corner of screen. Click mouse right button; there will be a pop-up box. Select **Button**, then a squared box shows up.
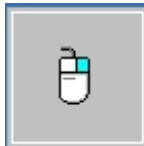
Change right/ left button by click the icon on screen. Cyan area expresses what button has been selected. After select the button, users can touch the panel to control mouse activities. Select/ De-select files or Drag icons on screen, whatever the mouse behaves.

[Quit]

Exit *TouchKit* touch panel utility.

Windows CE.NET Stylus

Steps of installation

There are two driver package versions and showed as below:

Use CE.NET bundle calibration utility

Use *Stylus* dedicated configuration utility.

USB interface driver installation with CE.NET bundle calibration utility. File List:

USBPort.dll   - USB touch screen driver

Touchp.dll   - USB touch screen driver

Calibration.exe   - provide a program of calibration (Programmer could choose the path while building the image of CE platform. This program is not necessary for CE.NET)

Note: Users select the UHCI or OHCI USB Host Controller driver into the platform, which supported by the target device, and check the USB mouse can go well at the same port.

Select the **Touch Display [stylus]** into the platform. Users can see:

"Catalog\Core OS\Display based devices\Shell and User Interface\Touch Display[Stylus]"

Select the **Mouse** into the platform. Users can see:

"Catalog\Core OS\Display based devices\Shell and User Interface\Mouse"
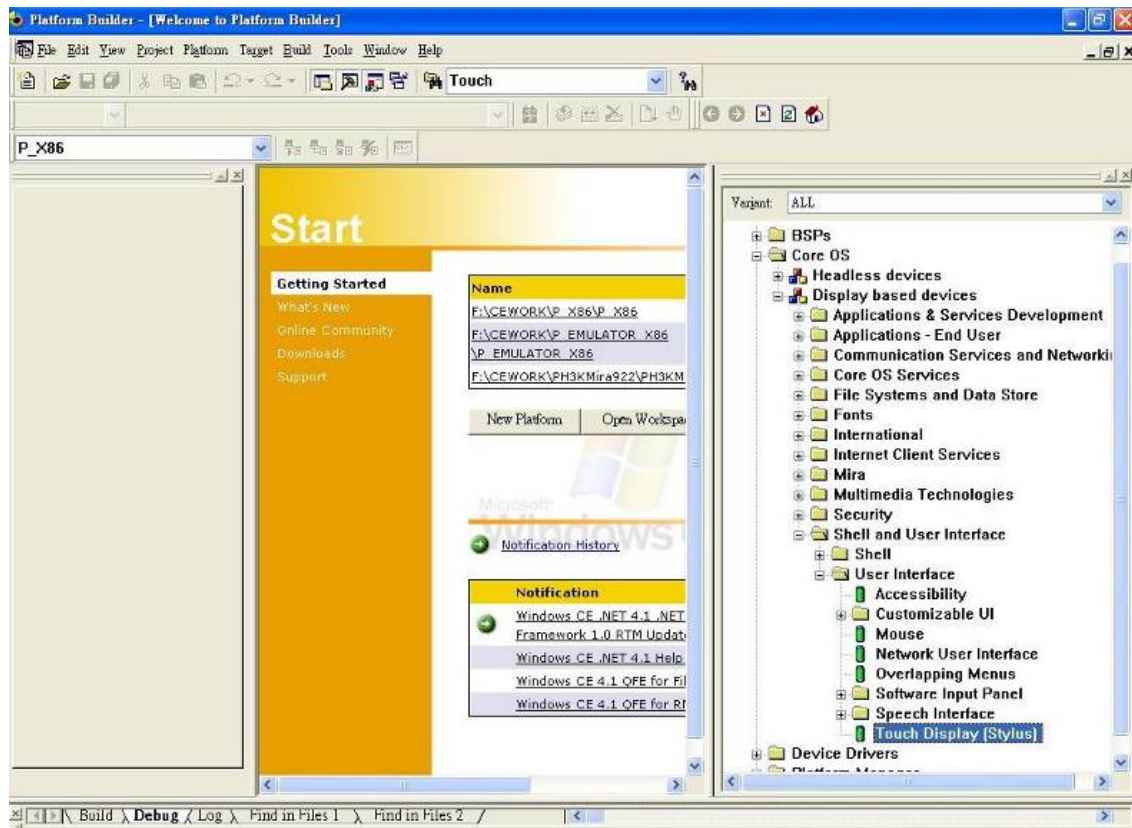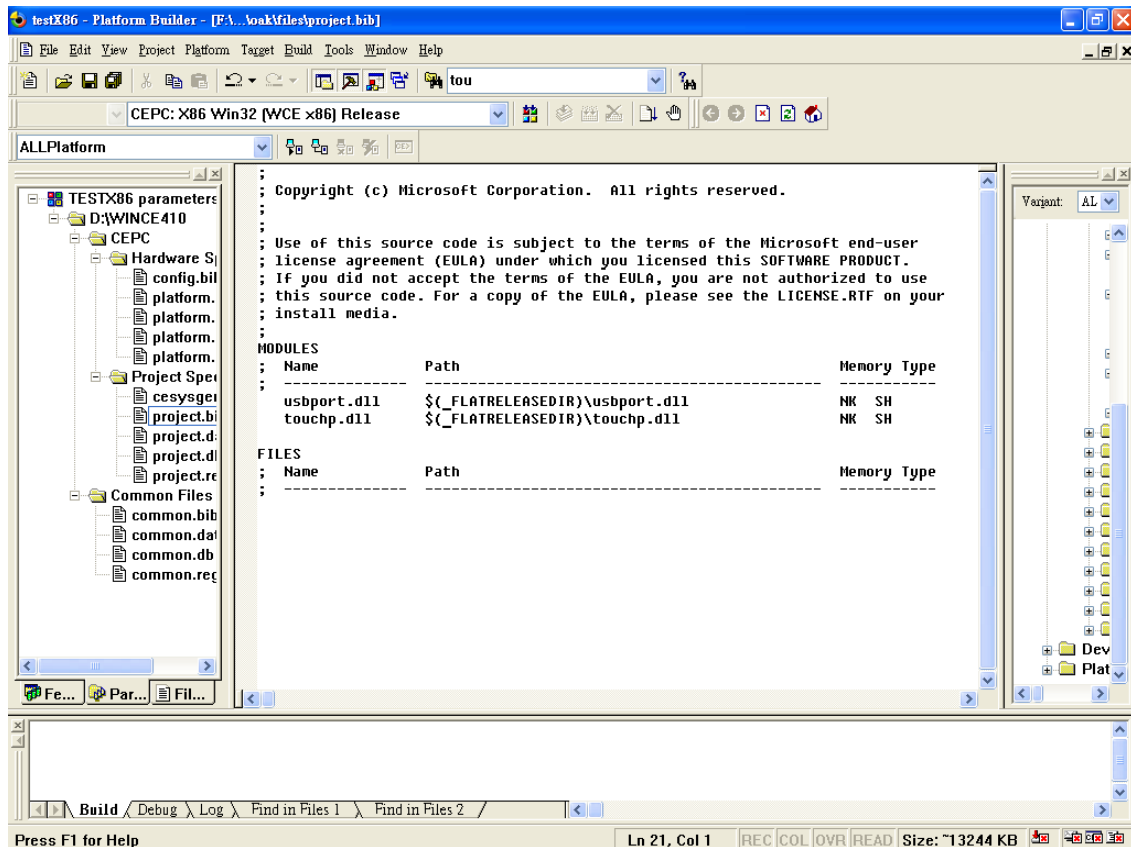
1.   Create a sub-folder **"CEDB"** under **C:**

2.   Copy files **USBPort.dll** and **Touchp.dll** to the directory.

3.   Launch platform builder and open the platform workspace.

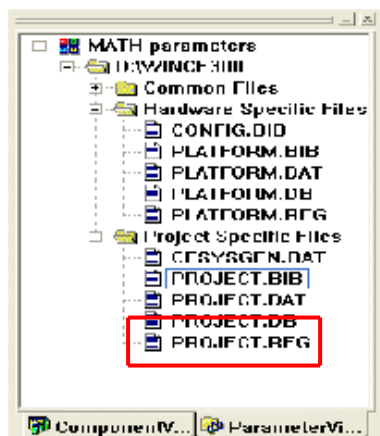4.   Edit the **PROJECT.BIB** in the Parameter View of Platform Builder.
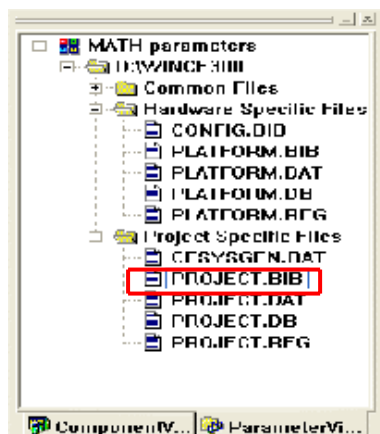
5. Add these two lines in Modules:

usbport.dll   **C:\CEDB\usbport.dll**   **NK SH**

touchp.dll   **C:\CEDB\touchp.dll**   **NK SH**

6. Edit the **PROJECT.REG** in the Parameter View of Platform Builder.

7. Add these lines for registry:

[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\TOUCH]

> **"DriverName"="Touchp.dll"**

> **"CalibrationData"="102,102 1945, 102 1945,1945 102,1945"**

> **"BCLEFT"=dword:64**

> **"BCRIGHT"=dword:64**

> **"BCTOP"=dword:64**

> **"BCBOTTOM"=dword:64**

Then copy the following sentences to the **PROJECT.REG**

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\14371_1\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBPort.dll"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\14371_2\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBPort.dll"

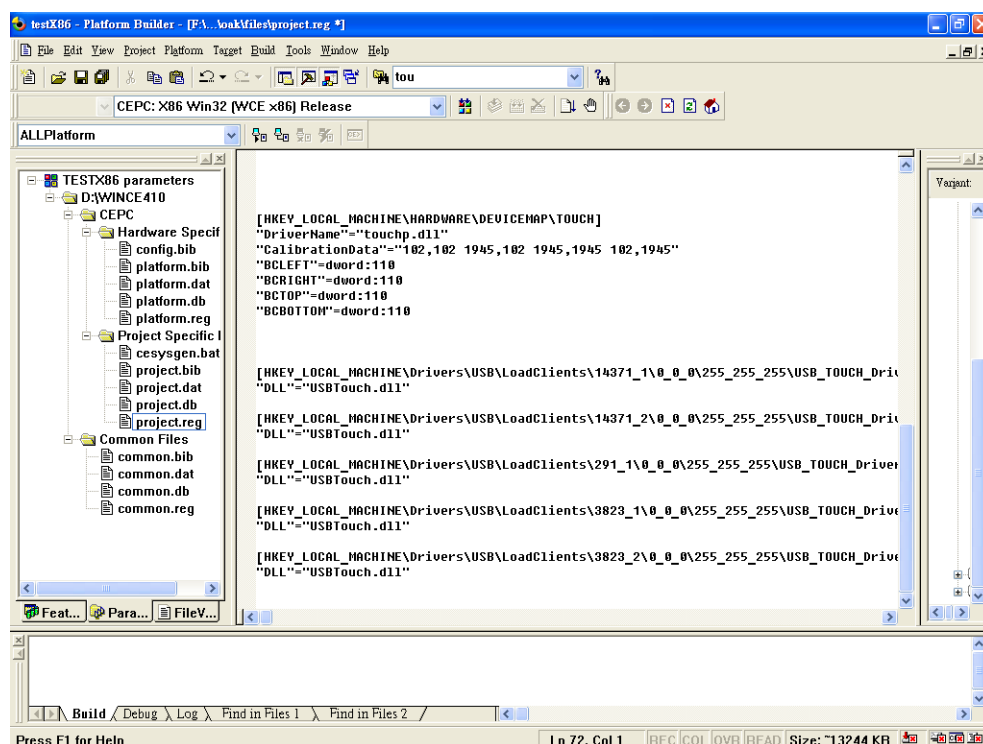**[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\4660_1\0_0_0\255_255_255\USB_TOUCH_Driver]**

"DLL"="USBPort.dll"

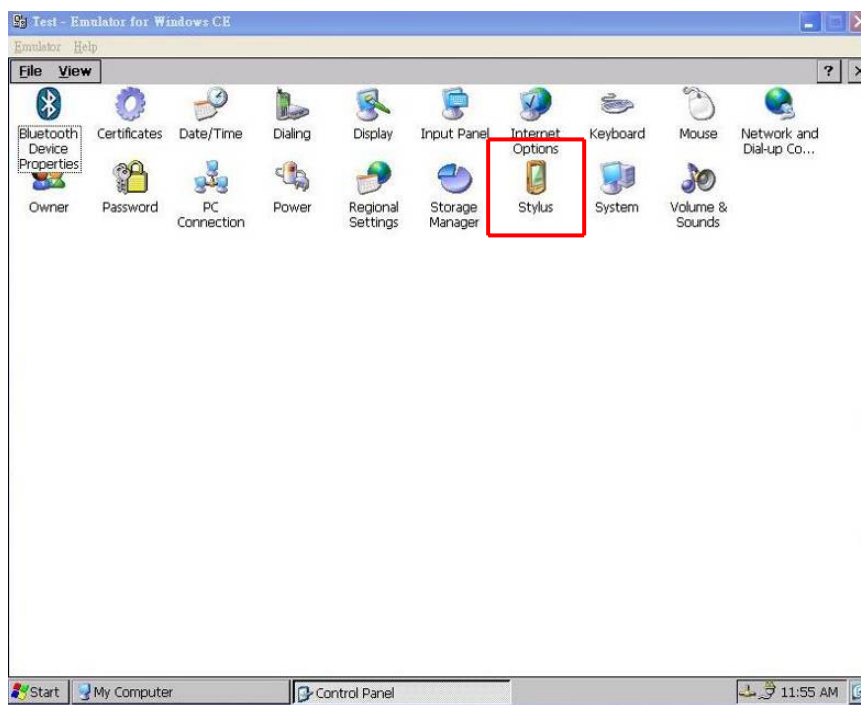**[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\3823_1\0_0_0\255_255_255\USB_TOUCH_Driver]**

"DLL"="USBPort.dll"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients3823_2\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBPort.dll"

8. After building the image of CE.NET and load it to hardware platform. Users can use the stylus to do the calibration, which can be found in the control panel.

9. If the user wants to keep the calibration data after WINCE reboot, please write **WINCE REGISTRY** to FLASH or other storages on target.

RS232 interface driver installation with CE.NET bundle calibration utility. File List:

Touchp.dll   - RS232 touch screen driver

Calibration.exe   - provide a program of calibration (Programmer could choose the path while building the image of CE platform. This program is not necessary for CE.NET)
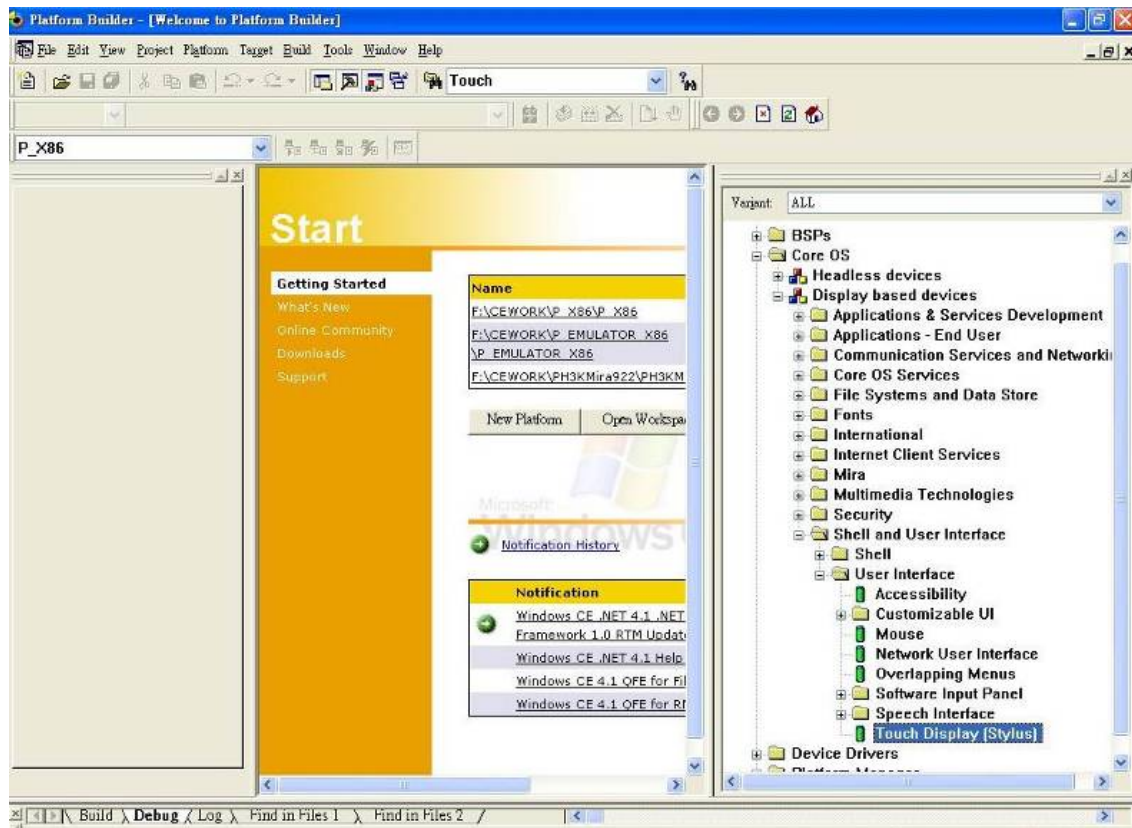
Note:

Select the **Touch Display [stylus]** into the platform. Users can see:

"Catalog\Core OS\Display based devices\Shell and User Interface\Touch Display[Stylus]"

Select the **Mouse** into the platform. Users can see:

"Catalog\Core OS\Display based devices\Shell and User Interface\Mouse"

1. Create a sub-folder **"CEDB"** under **C:**

2. Copy files **USBPort.dll** and **Touchp.dll** to the directory.

3. Launch platform builder and open the platform workspace.

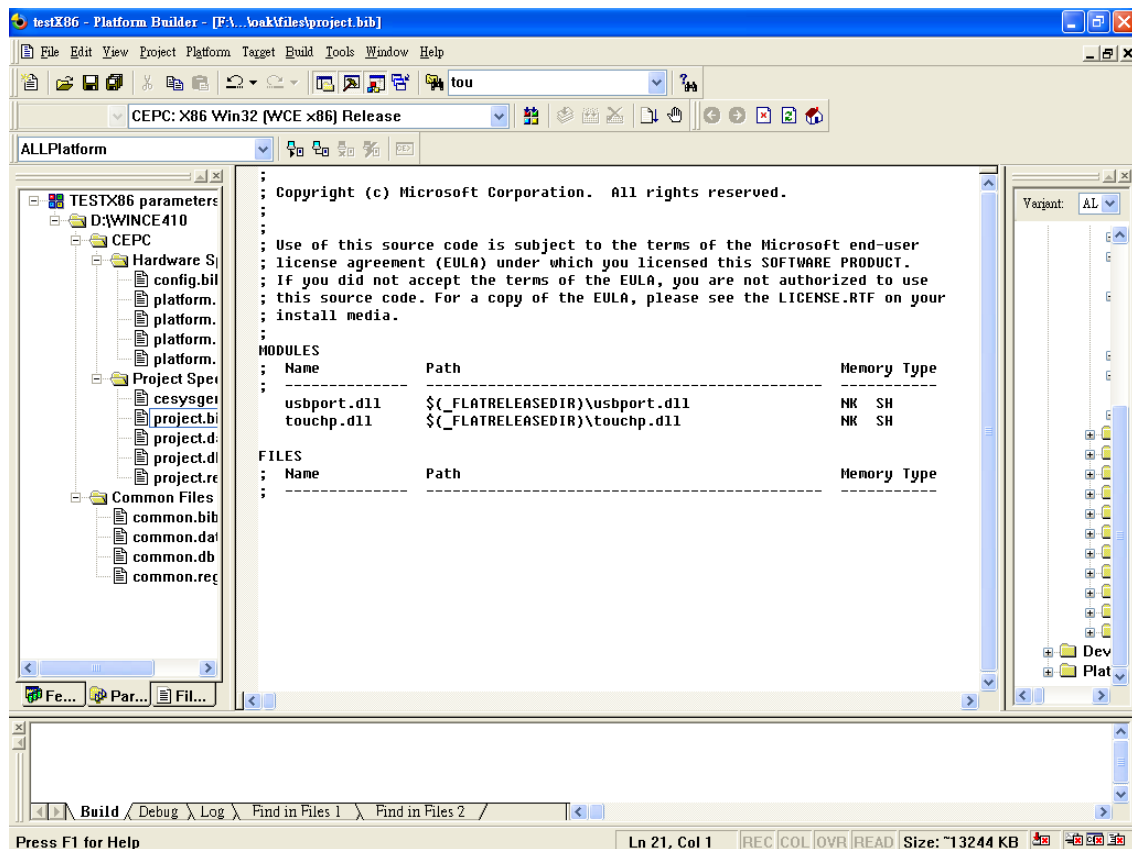4. Edit the **PROJECT.BIB** in the Parameter View of Platform Builder.
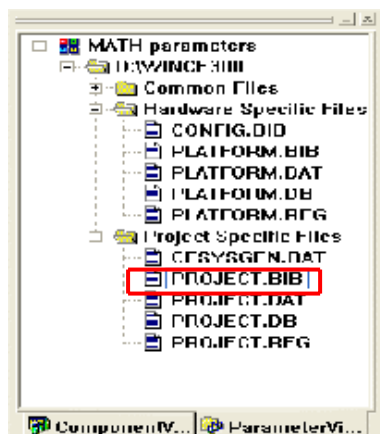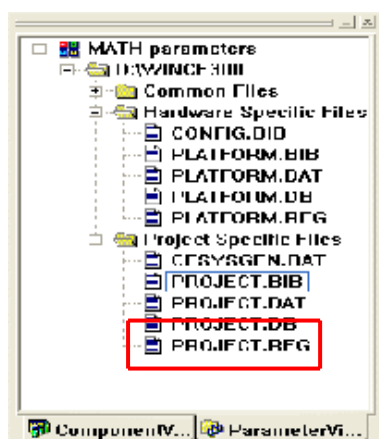
5.   Add these two lines in Modules:

    touchp.dll   **C:\CEDB\touchp.dll**   **NK SH**

6.   Edit the **PROJECT.REG** in the Parameter View of Platform Builder.

7. Add these lines for registry:

    [HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\TOUCH]

    "DriverName"="Touchp.dll"

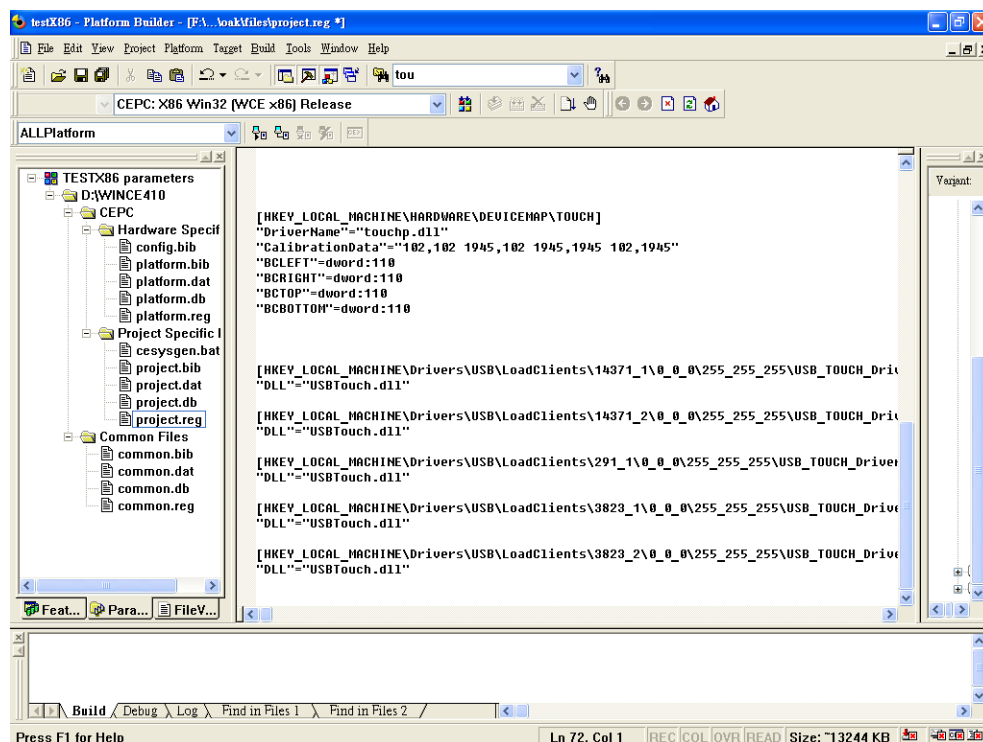   **"CalibrationData"="102,102 1945, 102 1945,1945 102,1945"**

    "COMM"="COM1:"

    "BCLEFT"=dword:64
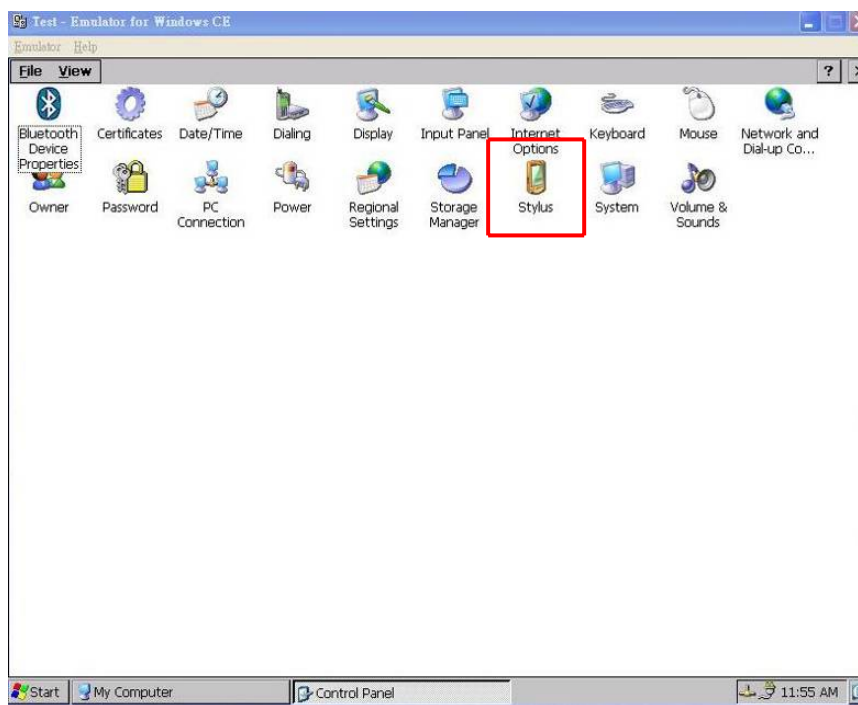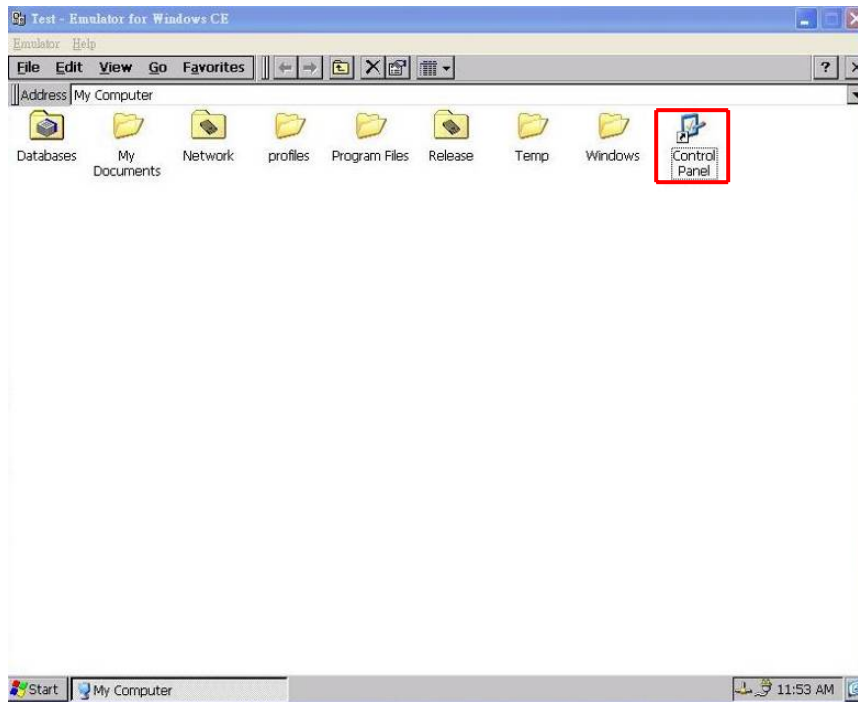
    "BCRIGHT"=dword:64

    "BCTOP"=dword:64

    "BCBOTTOM"=dword:64

8. The setting of COMM is the COM users want to use, and users can setup it in the upper registry.

9. After building the image of CE.NET and load it to hardware platform. Users can use
    the stylus to do the calibration, which can be found in the control panel.

11. If the user wants to keep the calibration data after WINCE reboot, please write **WINCE REGISTRY** to FLASH or other storages on target.

Windows CE.NET & CE 5.0

Steps of installation

Touch driver installation with *TouchKit* utility. File List:

USBTouch.dll   - USB touch screen driver
TouchKit.dll   - RS232 touch screen driver
TouchKit.exe   - TouchKit utility
DrawTest.exe   - DrawTest utility
Calibration.exe   - Calibration utility
UpdateEEPROM.exe   -Update EEPROM utility

Note: 1. If users use USB controllers, users select the UHCI or OHCI USB Host Controller driver into the platform, which supported by the target device, and check the USB mouse can go well at the same port.

2. If users use RS232 controllers, users have to make sure Windows CE has the driver of serial port.

Select the "Mouse" into your platform. This can find in:
"Catalog\Core OS\Display based devices\Shell and User Interface\Mouse"
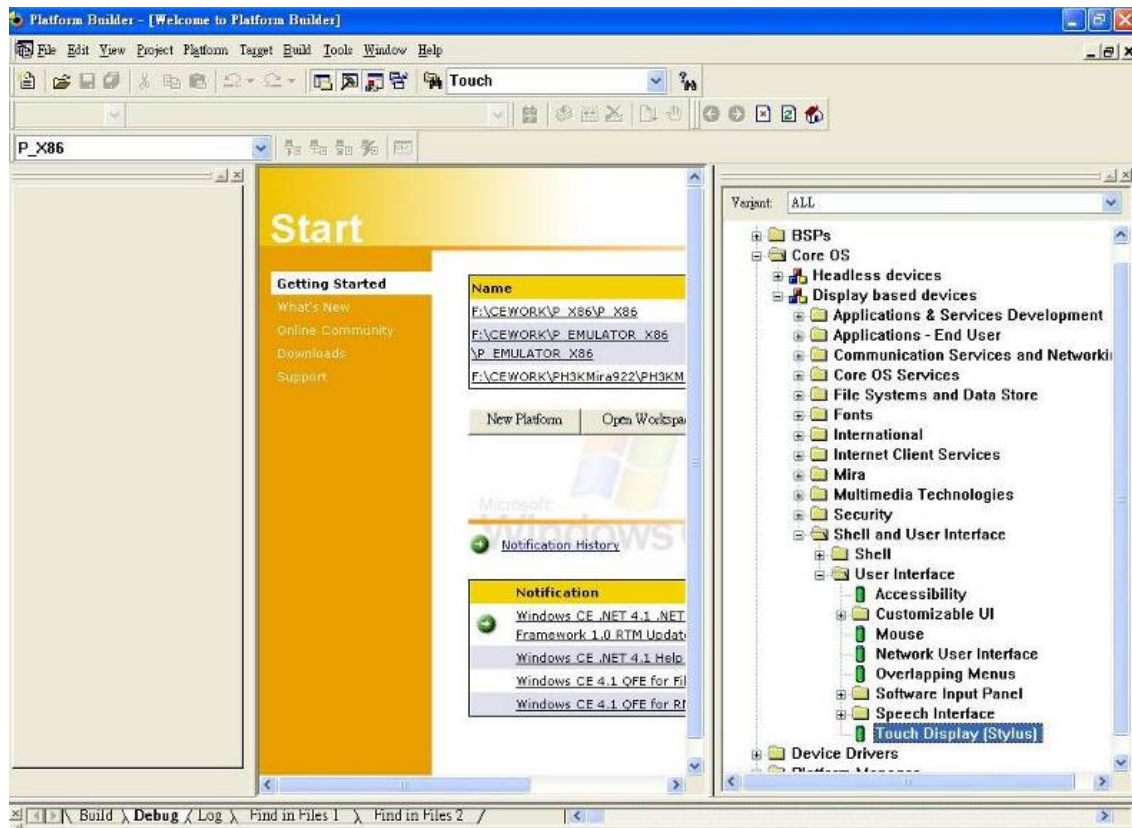
1. Create a sub-folder **"CEDB"** under **C:**

2. Copy files **USBTouch.dll**, **TouchKit.dll**, **TouchKit.exe**, **DrawTest.exe**, **Calibration.exe** and **UpdateEEPROM.exe** to the directory.

3. Launch platform builder and open the platform workspace.

4. Edit the **PROJECT.BIB** in the Parameter View of Platform Builder.
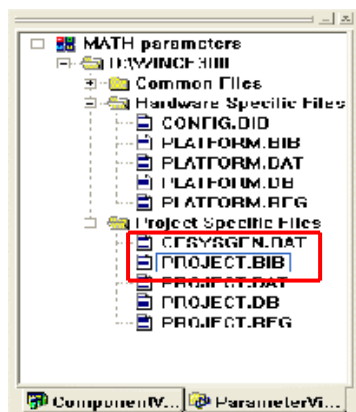
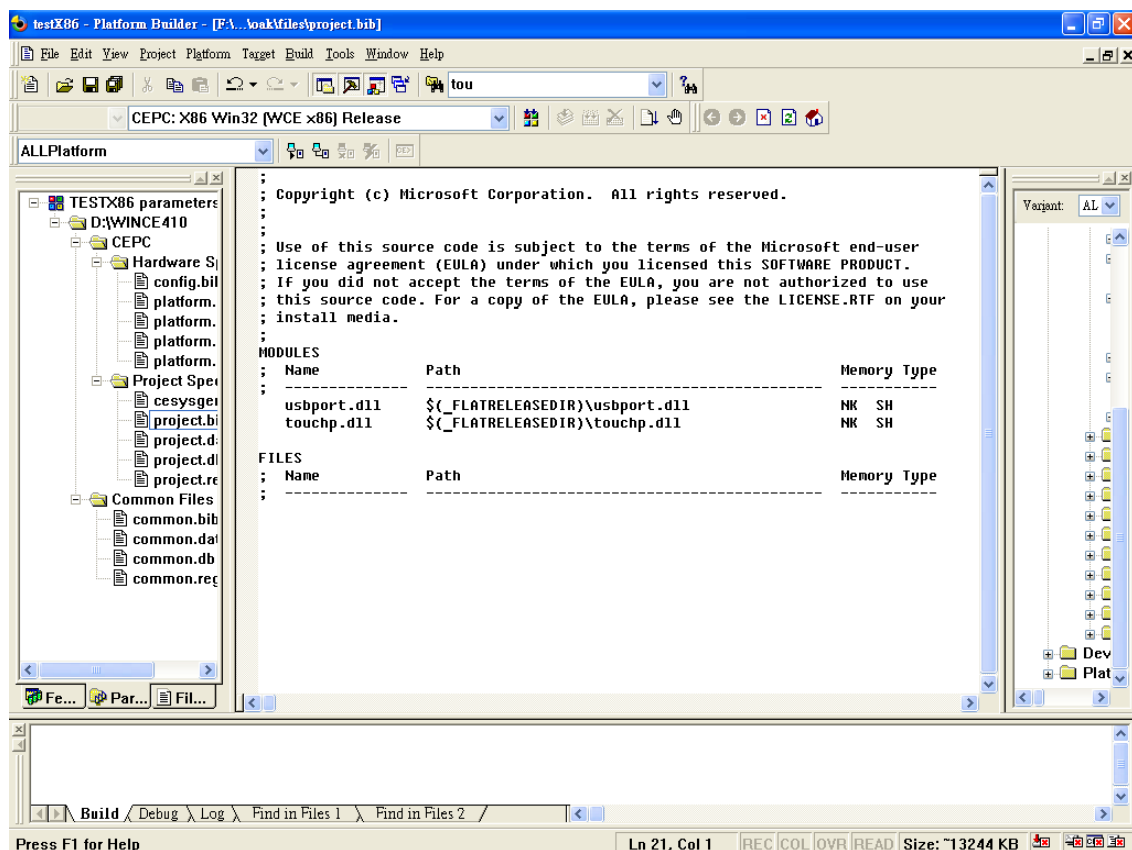5. Add these two lines in Modules:

   a) *TouchKit* utility:

   TouchKit.exe   **C:\CEDB\TouchKit.exe**   **NK S**

   DrawTest.exe   **C:\CEDB\DrawTest.exe**   **NK S**

   Calibration.exe   **C:\CEDB\Calibration.exe**   **NK S**

   UpdateEEPROM.exe   **C:\CEDB\Calibration.exe**   **NK S**

   b) If users want to use USB module:

   USBTouch.dll   **C:\CEDB\USBTouch.dll**   **NK SH**

   c) If users want to use RS232 module:

   TouchKit.dll   **C:\CEDB\TouchKit.dll**   **NK SH**

6. Edit the **PROJECT.REG** in the Parameter View of Platform Builder.
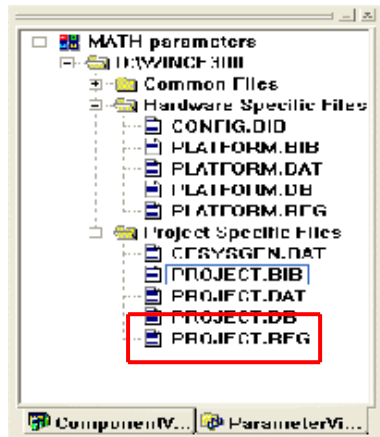
7. Add these lines for registry:

a) Add the registry setting for all modules:

[HKEY_LOCAL_MACHINE\Drivers\TouchKit]

"RBSIZE"=dword:800

"RBTIME"=dword:989680

"FLAGS"=dword:1----------------------->set 0x1 sofware filter enable

                                                  set 0x3000 update eeprom function enable

"ZfilterThreshold"=dword:800

"ZfilterBound"=dword:00100001

"SoundType"=dword:0----------------------->This is the default sound type

                                                  SoundType = 0 is no sound

                                                  SoundType = 1 is Beep in touch down

                                                  SoundType = 2 is Beep in lift off

b) If users want to use USB module:

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\14371_1\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBTouch.dll"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\14371_2\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBTouch.dll"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\4660_1\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBTouch.dll"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\3823_1\0_0_0\255_255_255\USB_TOUCH_Driver]

"DLL"="USBTouch.dll"

[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients3823_2\0_0_0\255_255_255\USB_TOUCH_Driver]

**"DLL"="USBTouch.dll"**

c) If users want to use RS232 module1:

[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\TouchKit1]

"Dll"="TouchKit.dll"

"Order"=dword:00000001

"Prefix"="TKT"

"Index"=dword:00000001

"Context"=dword:1;--------------------->This is the COM Port index which users use

If users want to use RS232 module2:

[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\TouchKit2]

"Dll"="TouchKit.dll"

"Order"=dword:00000001

"Prefix"="TKT"

"Index"=dword:00000002

"Context"=dword:2;--------------------->This is the COM Port index which users use

Configuration Utility and Right Button Emulator

Run TouchKit.exe file to execute it. Before users do the calibration or draw test, the module has to be selected.
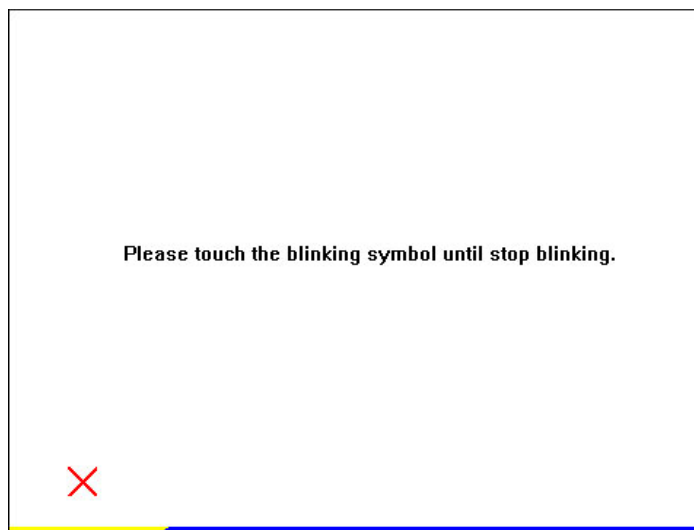
TUBX is the USB module

TKTX is the RS232 module
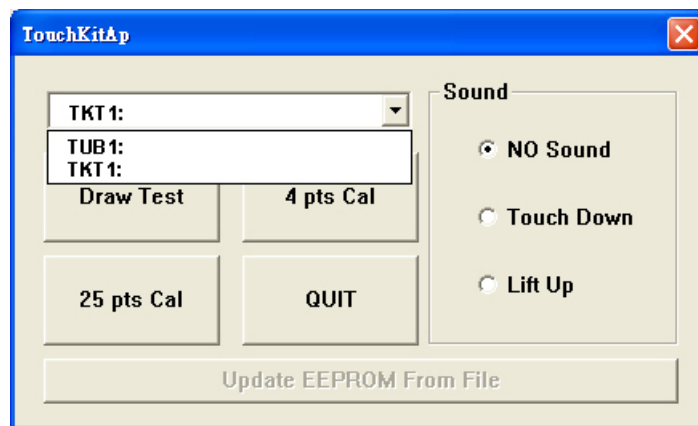
There are six functions, which are **[Calibrate 4pt]**, **[Draw Test]**, **[Calibrate 25pt]** and **[Quit]**.
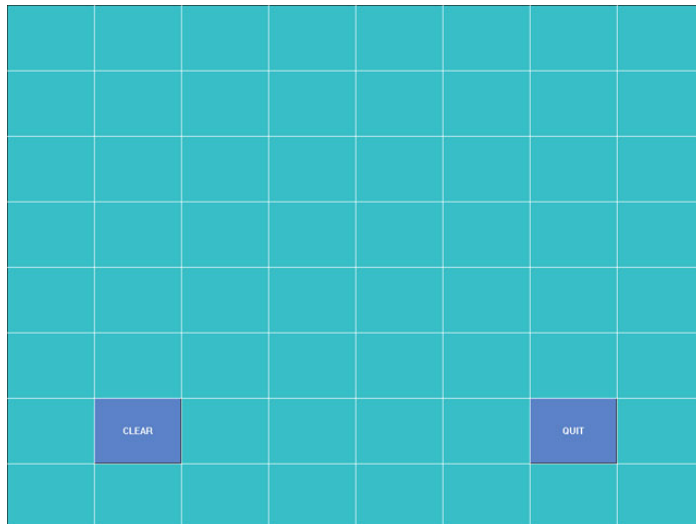
[Calibrate 4pt]

Correct 4-point locations on screen with the panel. Press **[Calibrate 4pt]**, screen displays as follows.
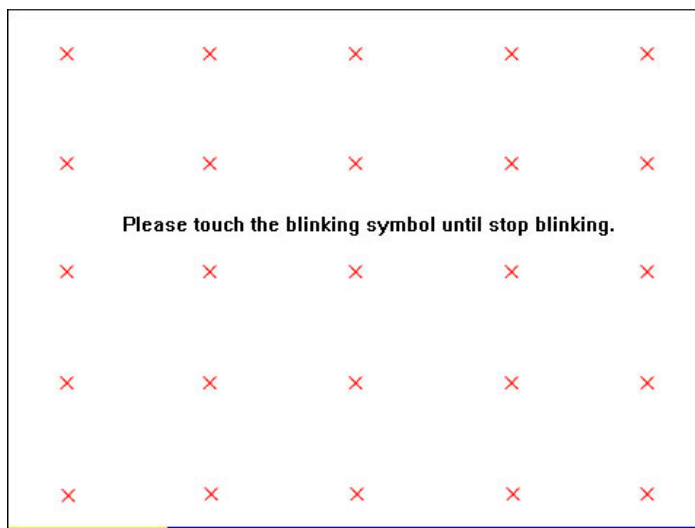
[Draw Test]

Test the drawing position related to the display screen on panel. Click **[Draw Test]** button, and then there will be a squared blue display showing.

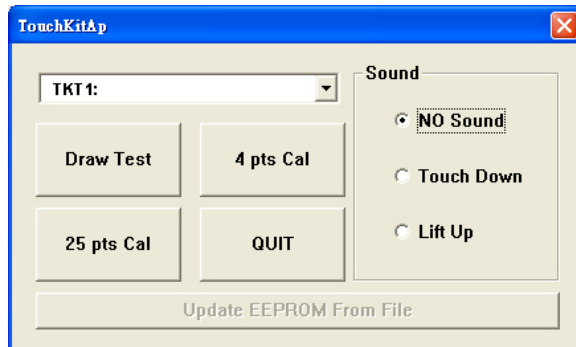In testing, users can click [Clear] and [Quit] to clear and quit the test.

[Calibrate 25pt]

Press **[Calibrate 25pt]** to do 25 points calibration. Correct 25-point locations on screen with the panel.
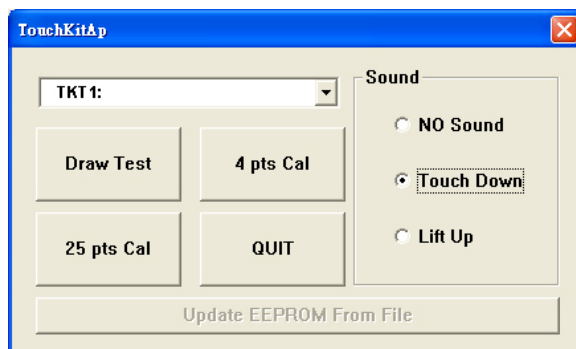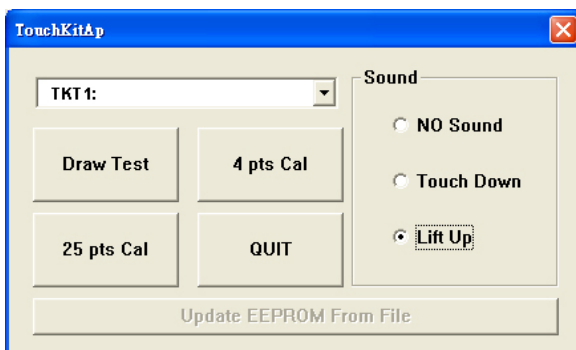
[Sound]

No sound

Users could choose to make no sound while using the touch panel.

Touch Down

The system will make sound while touching the panel.

Life Up

The system will not make any sound until finger leaves the touch panel.

[Right Button]

If the users want to emulate right button, the users can touch and keep the finger on the panel for two to three seconds. The last touch will be emulated the mouse right button. The users can change the waiting time and the stop size in registry value **"RBTIME"** and **"REVALUE"**.

[Quit]

Exit *TouchKit* touch panel utility.