

**TouchKit TouchScreen Controller  
User Guide  
for Windows CE  
Version: 2.0.3**

## CONTENT

<b>CHAPTER 1. TOUCH PANEL CONTROLLER.....</b>	<b>2</b>
1.1 CONTROLLER.....	2
1.2 SPECIFICATIONS AND FEATURES.....	3
<b>CHAPTER 2. INSTALLING AND USING TOUCHKIT.....</b>	<b>5</b>
2.1 FOR WINDOWS CE 2.12 / 3.0.....	5
2.2 FOR WINDOWS CE .NET (VERSION 4.0, 4.1& 4.2) .....	6
<b>CHAPTER 3. CONFIGURATION UTILITY AND RIGHT BUTTON EMULATOR....</b>	<b>18</b>
3.1 FOR WINDOWS CE 2.12 / 3.0.....	18
3.2 FOR WINDOWS CE .NET (VERSION 4.0, 4.1& 4.2) .....	22

# Chapter 1. Touch Panel Controller

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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 or USB connector. 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.

## 1.1 Controller

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

## 1.2 Specifications and Features

Specifications for **Touchkit** controller.

Specifications	
Power requirements	+5VDC ( Maximum 100mA, typical 70mA, 50mV peak to peak maximum ripple )
Operating temperature	0 to 50 °C
Storage Temperature	-40 to 80 °C
Relative Humidity	95% at 60 °C
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

## 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 Feature	<ol style="list-style-type: none"> <li>1. Support monitor / display rotation</li> <li>2. Support multiple monitor / display</li> <li>3. Support QVGA and Half-VGA function</li> <li>4. Support edge compensation</li> </ol>
Controller Setting	<ol style="list-style-type: none"> <li>1. Support multiple controllers</li> <li>2. Dynamical add / remove controllers</li> <li>3. Change Controller interface without reboot.</li> </ol>
Language	Support 10 languages for Windows
Mouse Emulator	<ol style="list-style-type: none"> <li>1. Right / Left button emulation</li> <li>2. Normal / Click on touch / Click on release mode</li> <li>3. Auto right button</li> </ol>
Sound Notification	<ol style="list-style-type: none"> <li>1. Sound option ( No sound / Touch Down / Lift Up )</li> <li>2. Frequency adjustment</li> <li>3. Duration adjustment</li> </ol>
Double Click	<ol style="list-style-type: none"> <li>1. Configurable double click speed</li> <li>2. Configurable double click area</li> </ol>
OS support	<ol style="list-style-type: none"> <li>1. Windows 95 / 98 / ME / NT4 / 2000 / XP / Windows XP Tablet PC Edition</li> <li>2. Windows CE 2.12, 3.0, .NET</li> <li>3. Linux ( X Window Version: 3, 4 Red Hat 6.0 ~ 9.0 Mandrake 5.0 ~ 9.1)</li> <li>4. iMac. OSX</li> <li>5. MS-DOS:</li> </ol> <p>Support display resolution: 320x200, 640x200, 640x350, 640x480, 800x600, 1024x768 and 1280x1024</p>
COM port support	<ol style="list-style-type: none"> <li>1. Support COM 1 ~ COM 256 for Windows and Linux</li> <li>2. Support COM 1 ~ COM 8 for DOS</li> </ol>

## Chapter 2. Installing and using TouchKit

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### 2.1 for Windows CE2.12/3.0

**TouchKit** is software, which contains drivers, configuration and right button utilities of the touch panel controllers for RS232 and USB on x86 CPU and Windows CE operation system.

The two utilities are as follows:

- **Configuration support**

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

- **Right button support**

This is utility for emulating the right and left button of mouse through controlling touch panel. Users can toggle between right or left mouse buttons by this utility.

There are totally five files in the **TouchKit** for Windows CE directory. 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.
3. **Note: TouchTray.exe** is the file of the Right Mouse Utility. It has to be started with computer booting. So, put this file to appropriate directory to satisfy this specific request.
4. Add some registry value as the content of **TouchKit.reg**.
5. 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.

## 2.2 for Windows CE.NET (for version 4.0, 4.1& 4.2 )

**TouchKit** is software, which contains drivers and configuration utilities of the touch panel controllers for RS232 and USB on x86 CPU and Windows CE operation system. There are two driver package version, and they are as follow:

- Use CE.NET bundle calibration utility
- Use TouchKit dedicated configuration utility, just like that for CE.3.0

**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 (Programer could choose the path while building the image of CE platform. This program is not necessary for CE .NET, you could use it or

not

as you wish )

**Notes:**

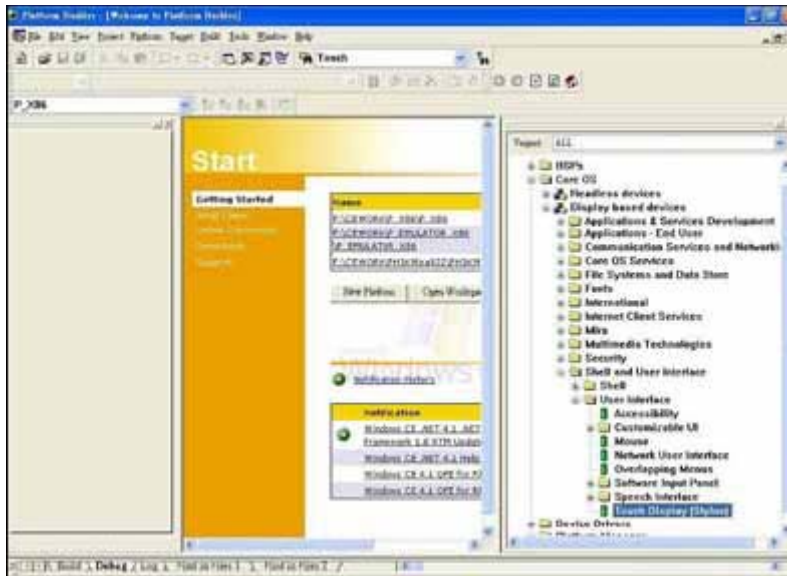
Select the UHCI or OHCI USB Host Controller driver into your platform, which supported by the target device. And check the USB mouse can go well at the same port

Select the **Touch Display[stylus]** into your platform. This can find in:

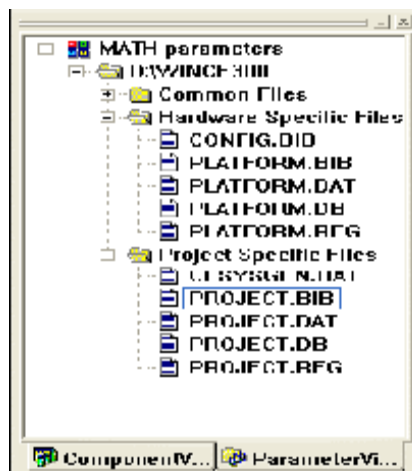
**"Catalog\Core OS\Display based devices\Shell and User Interface\Touch Display[Stylus]"**.

Select the **Mouse** into your platform. This can find in:

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

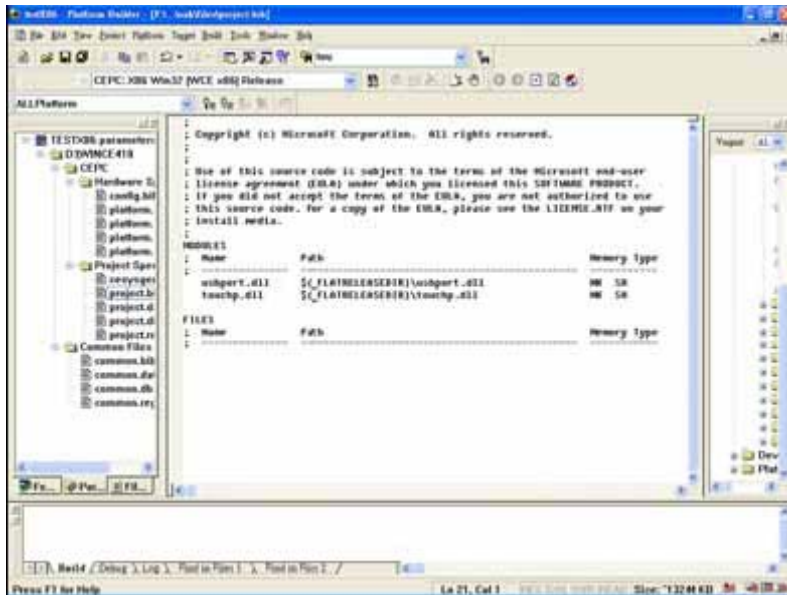


1. Open the directory within your platform directory  
 Ex: "\$(\_WINCEROOT)PUBLICTouchKit\ReIDir\CEPC\_X86Release" And  
 Copy these two files to this directory.
2. Launch platform builder and open your platform workspace
3. Edit the **PROJECT.BIB** in the Parameter View of Platform Builder.

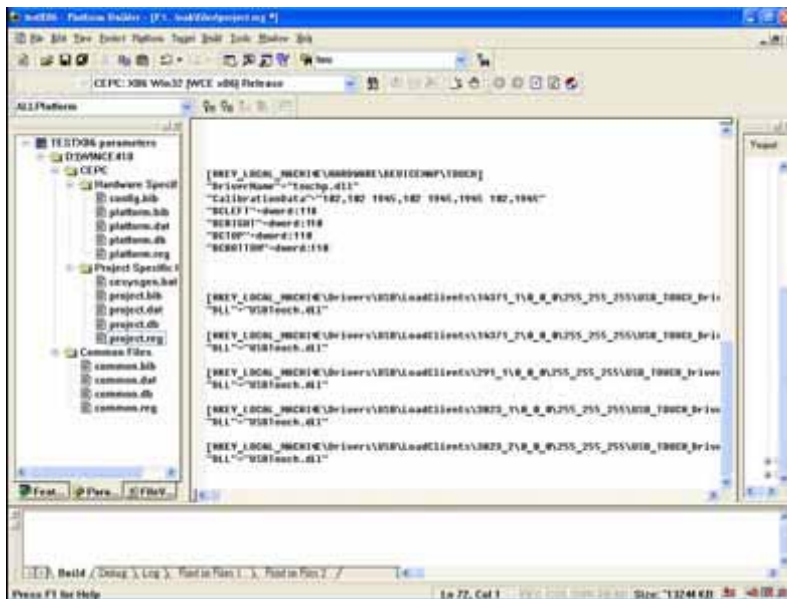


Add these two lines in MODULES:

```
usbport.dll    $(_FLATRELEASEDIR)\usbport.dll    NK SH
touchp.dll     $(_FLATRELEASEDIR)\touchp.dll     NK SH
```



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



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\291_1\0_0_0\255_255_255\USB_TOUCH_Driver]
```

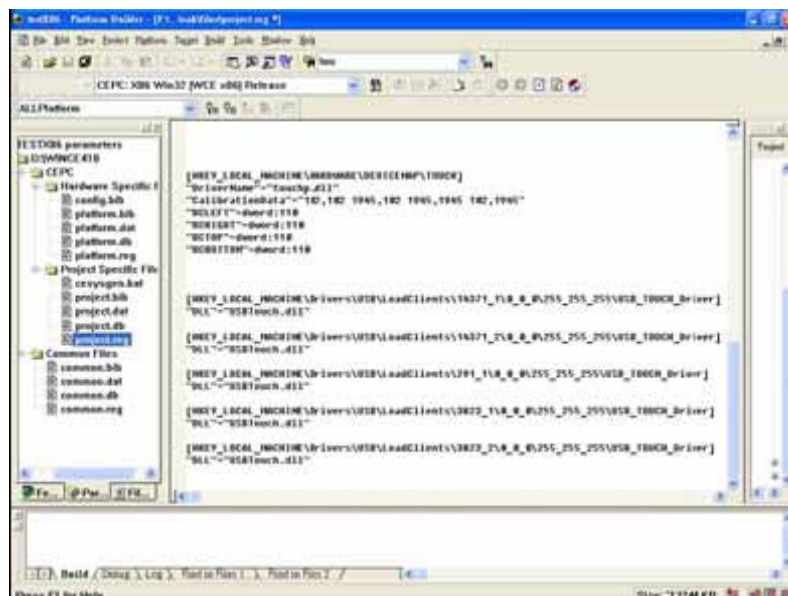
```
"DLL"="USBPort.dll"
```

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

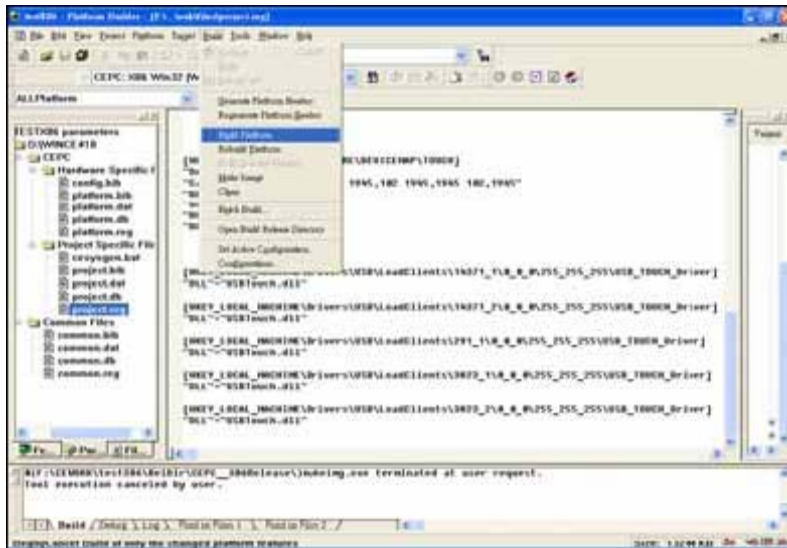
```
"DLL"="USBPort.dll"
```

```
[HKEY_LOCAL_MACHINE\Drivers\USB\LoadClients\3823_2\0_0_0\255_255_255\USB_TOUCH_Driver]
```

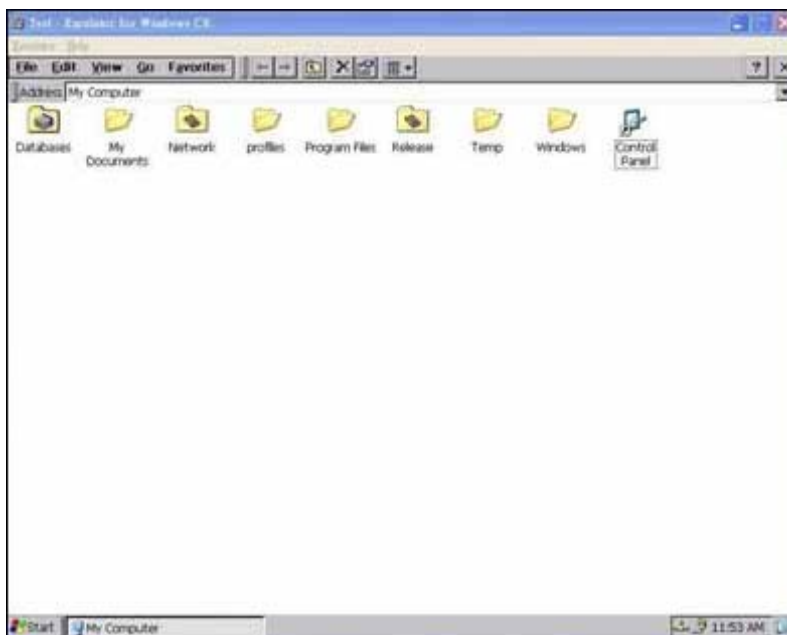
```
"DLL"="USBPort.dll"
```



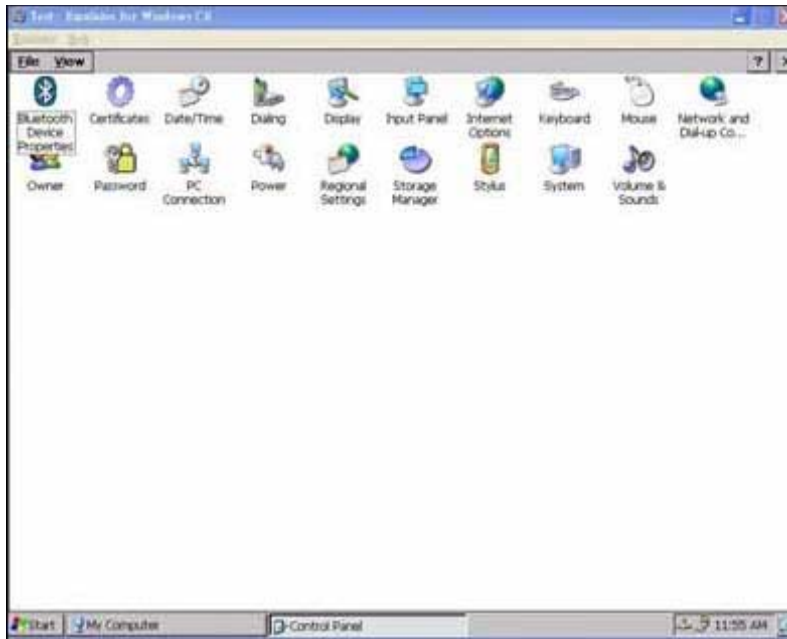
5. Build Platform (use **Build Platform**, not **Rebuild**), then load the image and reboot it.



6. 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.



Double click on **[Control Panel]**



Choose the [Stylus]



The calibration window shows

7. If you want to keep the calibration data after WINCE reboot, please write **WINCE REGISTRY** to FLASH or other storages on target.

## RS232 interface installation with CE.NET bundle calibration utility:

### File list:

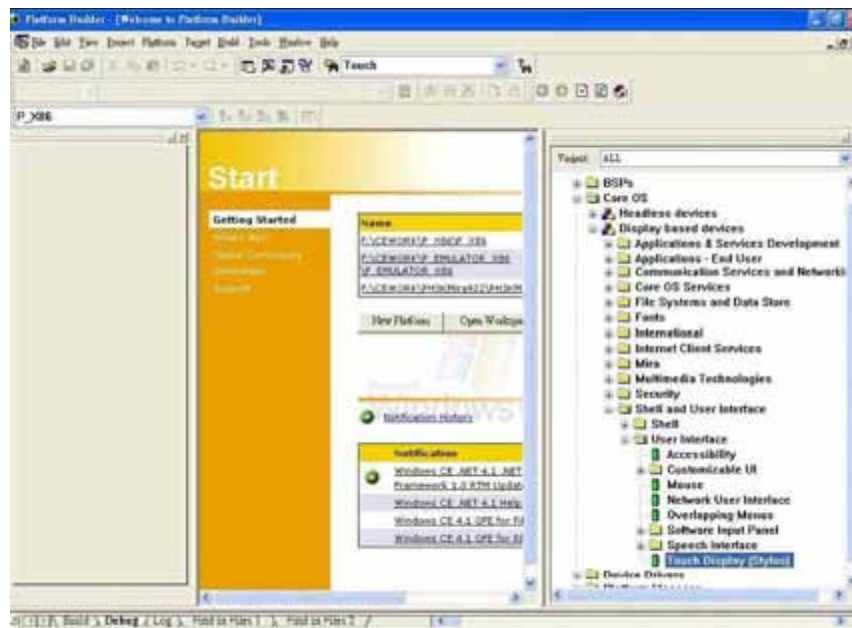
Touchp.dll - RS232 Touch Screen Driver  
Calibration.exe - provide a program of calibration ( Programmer could choose

the path of it while building the image of CE platform. This program is not necessary for CE .NET, you could use it or not as you wish )

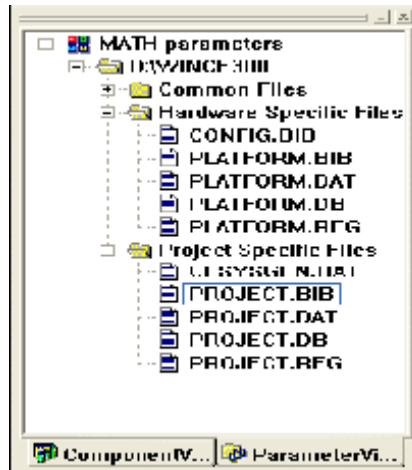
### Notes:

Select the **Touch Display[stylus]** into your platform. This can find in: "Catalog\Core OS\Display based devices\Shell and User Interface\Touch Display[Stylus]".

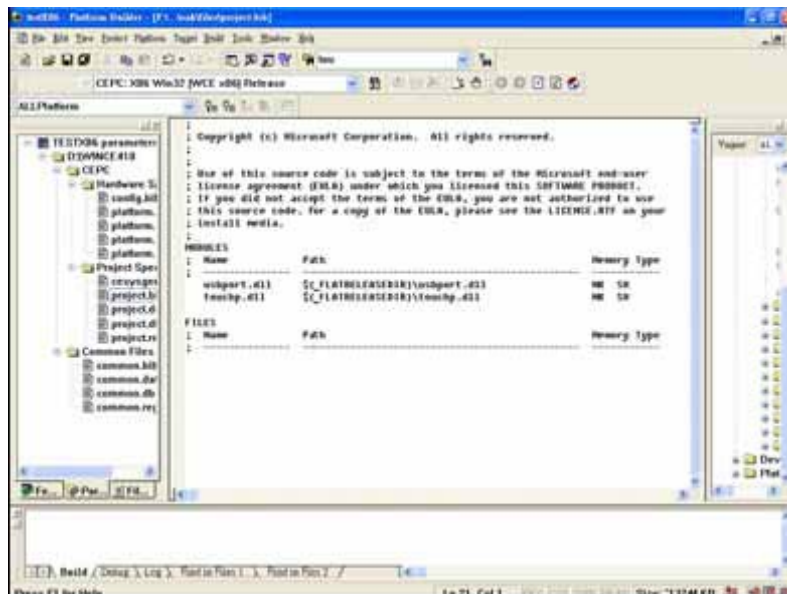
Select the **Mouse** into your platform. This can find in: "Catalog\Core OS\Display based devices\Shell and User Interface\Mouse"



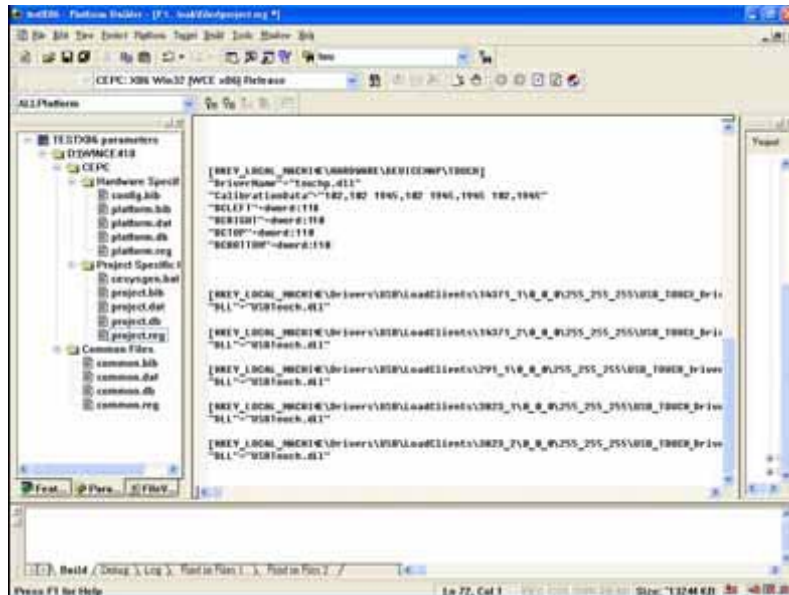
1. Open the directory within your platform directory  
Ex: "\$(\_WINCEROOT)PUBLIC\TouchKit\ReIDir\CEPC\_X86Release" And Copy this file to this directory.
2. Launch platform builder and open your platform workspace
3. Edit the **PROJECT.BIB** in the Parameter View of Platform Builder.



Add the line in MODULES as below:  
**touchp.dll \$(\_FLATRELEASEDIR)touchp.dll NK SH**



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



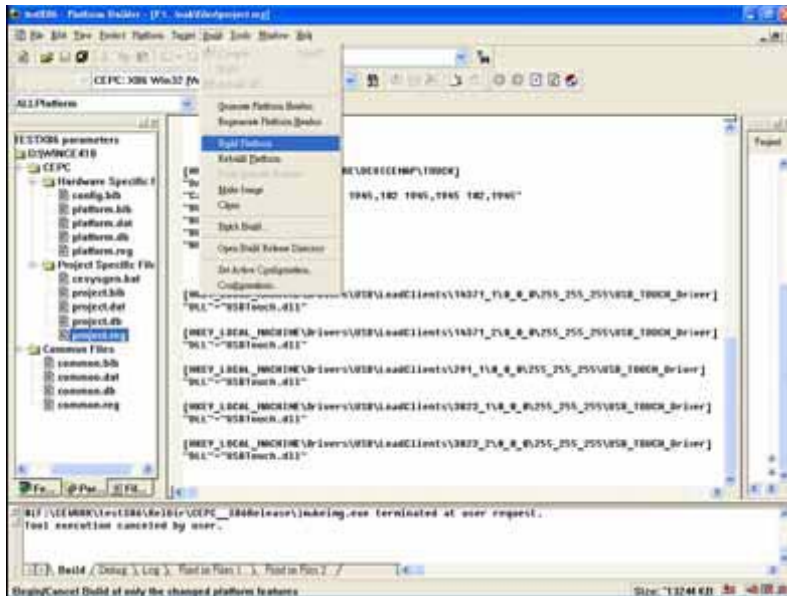
Add these lines for registry.

```

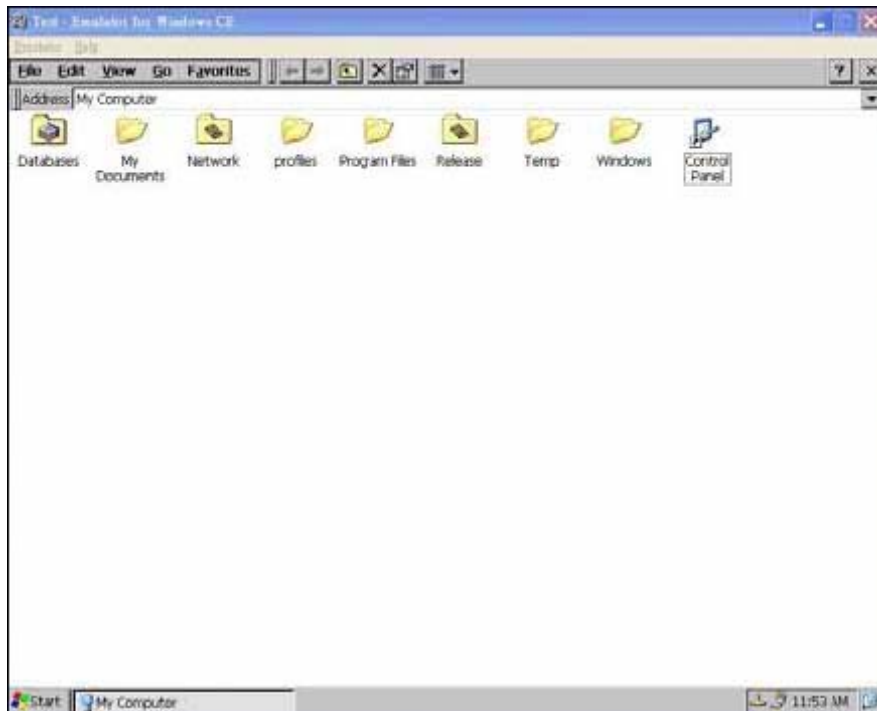
[HKEY_LOCAL_MACHINE\HARDWARE\DEVICEMAP\TOUCH]
  "DriverName"="Touchp.dll"
  "CalibrationData"="102,102 1945,102 1945,1945 102,1945"
  "COMM"="COM1:"
  "BCLEFT"=dword:64
  "BCRIGHT"=dword:64
  "BCTOP"=dword:64
  "BCBOTTOM"=dword:64
  
```

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

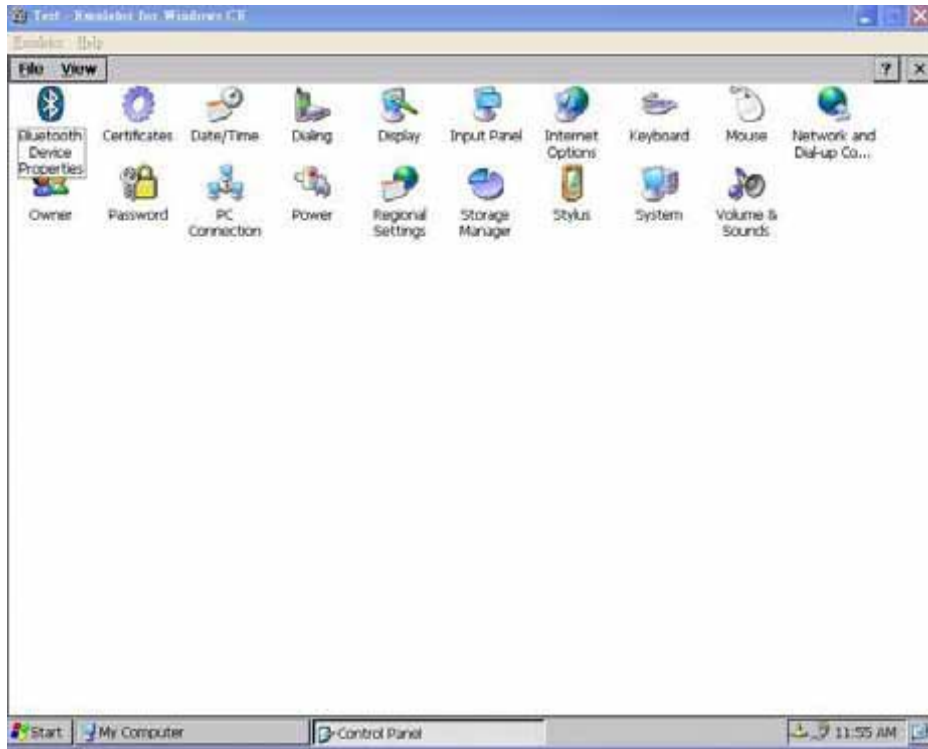
6. Build Platform (**use Build Platform, not Rebuild**), then load the image and reboot it.



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



Double click on **[Control Panel]**



Choose the [Stylus]



The Recalibration window shows

8. If you want to keep the calibration data after WINCE reboot, please write **WINCE REGISTRY** to FLASH or other storages on target.

**Note:**

**USB or RS232 installation driver with TouchKit dedicated calibration utility, just like that for CE.3.0:**

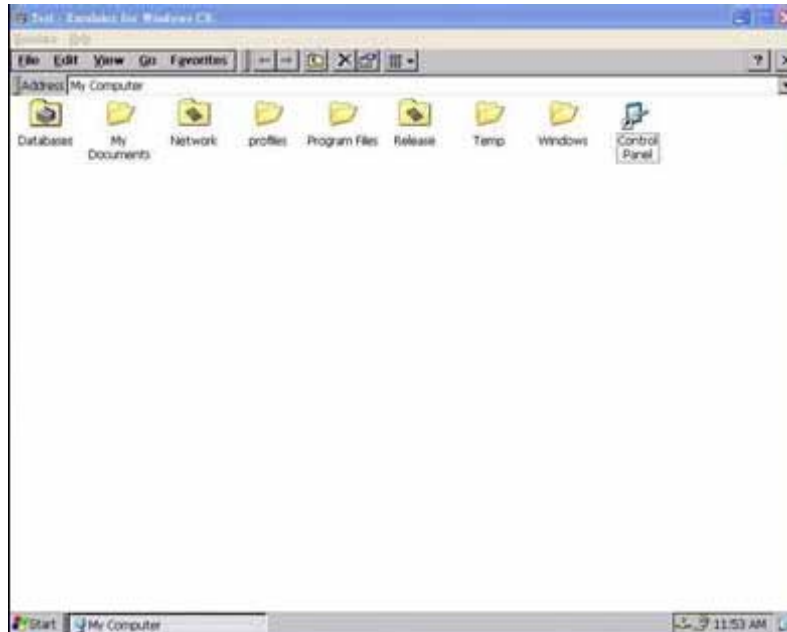
## Chapter 3. Configuration Utility and Right Button Emulator

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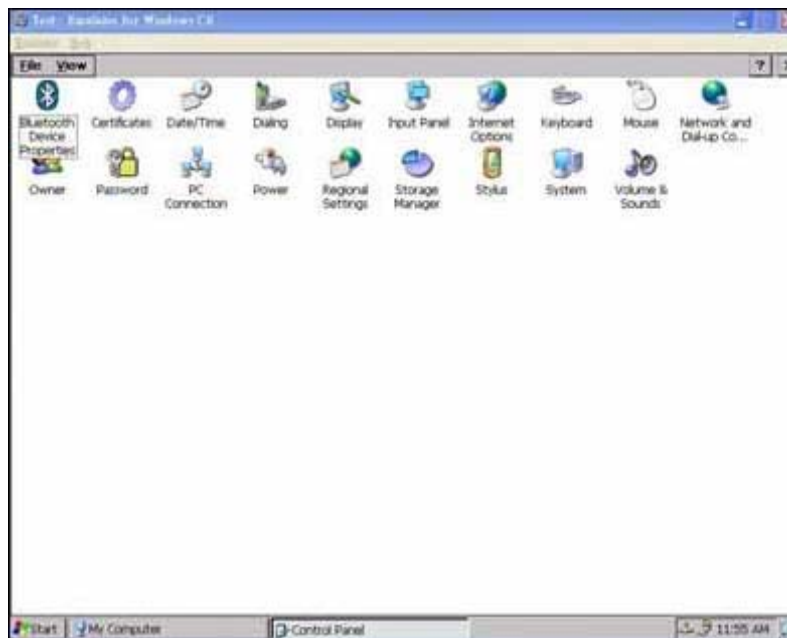
### 3.1 for Windows CE2.12/3.0

**With Win CE bundle calibration utility:**

Users can use the stylus to do the calibration, which can be found in the control panel.



Double click on **[Control Panel]**



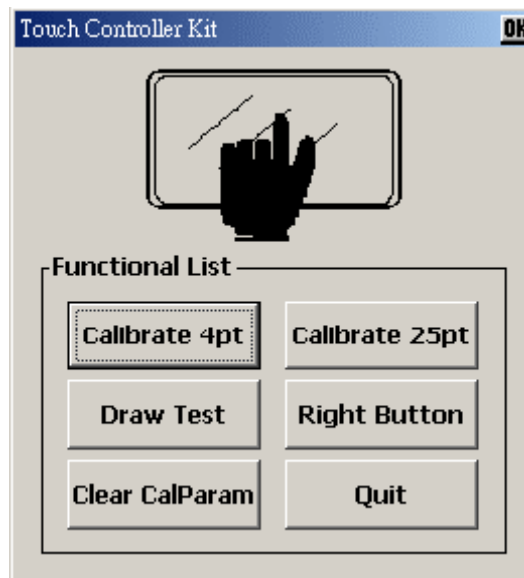
Choose the **[Stylus]**



The Recalibration window shows

With **TouchKit** dedicated configuration utility :  
Double click **TouchKit.exe** file to execute it.

There are six buttons, **[Calibrate 4pt]**, **[Draw Test]**, **[Clear CalParam]**, **[Calibrate 4pt]**, **[Right Button]** and **[Quit]**, on the AP.



### <Calibrate 4pt>

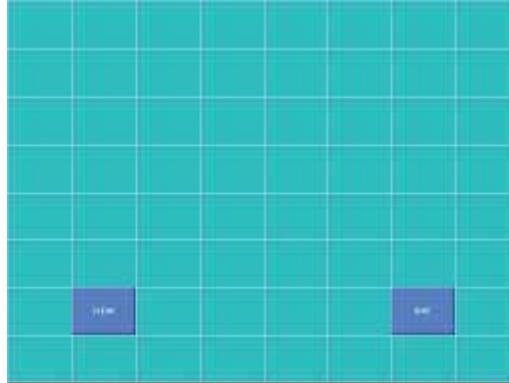
Correct 4 point locations on screen with the panel. Press on [Calibrate 4pt], screen displays as follows.



**Touch the blinking symbol on panel until beep or stop blinking.**  
There will be a message window after this correction.

### <Draw Test>

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



**Try to write or draw on it to verify the touch position.**  
Press **[CLEAR]** for cleaning touch screen, and press **[QUIT]** to exit **Draw Test**.

### <Clear CalParam>

Press **[Clear CalParam]** to clear the previous calibration records. The record will become default record.

### <Calibrate 25pt>

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



**Touch the blinking symbol on panel until beep or stop blinking.**

After the calibration, the new record will overwrite the old one.

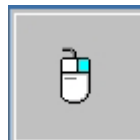
### <RIGHT BUTTON>

Right mouse emulator. The default value is **on**.

Click [**Right Button**] to close the right mouse emulator.

**Right Button** starts with the computer booting. A mouse icon is located in the right 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.

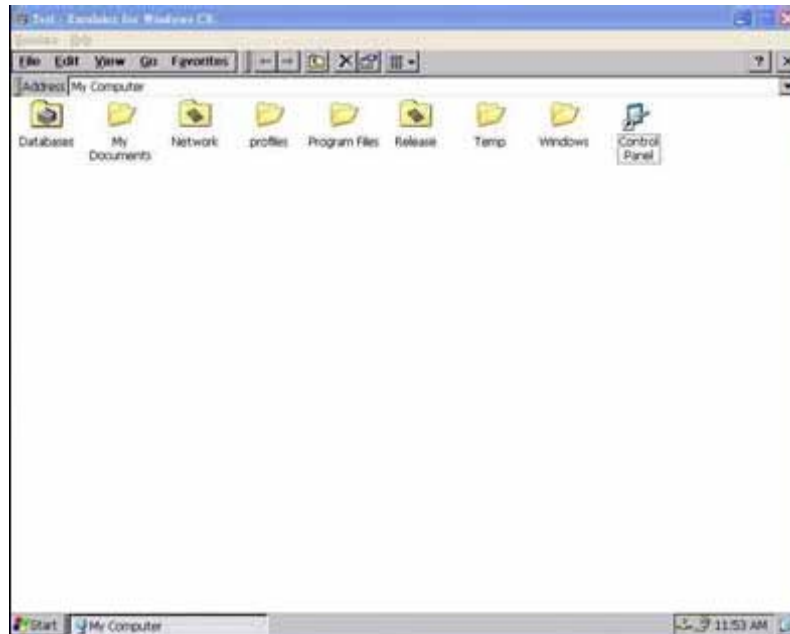
<Quit>

Exit *TouchKit* touch panel utility.

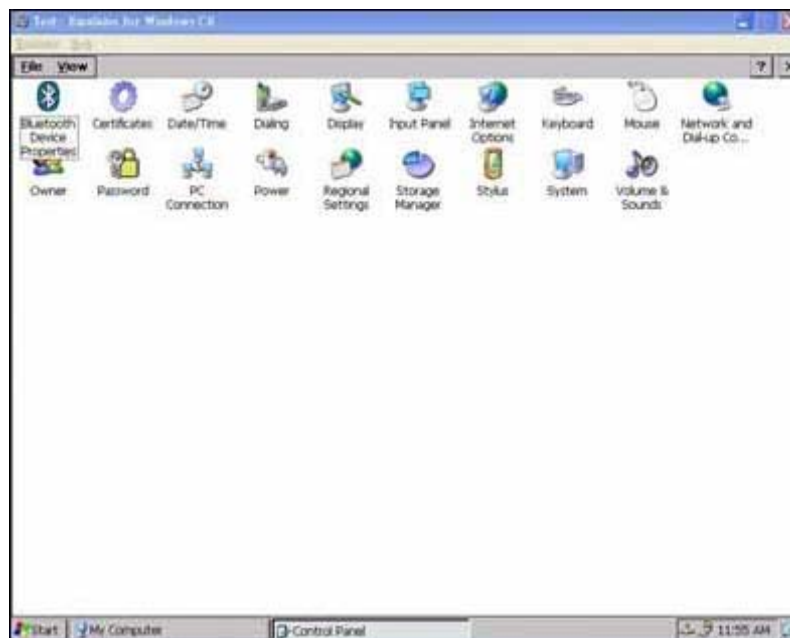
### 3.2 For Windows CE.NET

With Win CE.NET bundle calibration utility:

Users can use the stylus to do the calibration, which can be found in the control panel.



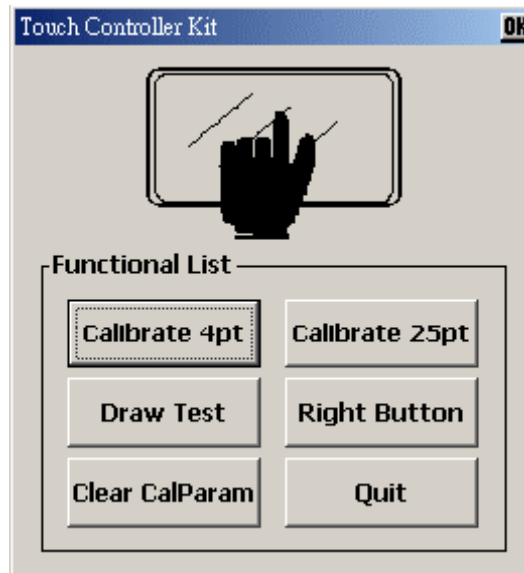
Double click on **[Control Panel]**



Choose the **[Stylus]**



The Recalibration window shows  
**With TouchKit dedicated configuration utility :**  
Double click **TouchKit.exe** file to execute it.  
There are six buttons, **[Calibrate 4pt]**, **[Draw Test]**, **[Clear CalParam]**,  
**[Calibrate 4pt]**, **[Right Button]** and **[Quit]**, on the AP.



### <Calibrate 4pt>

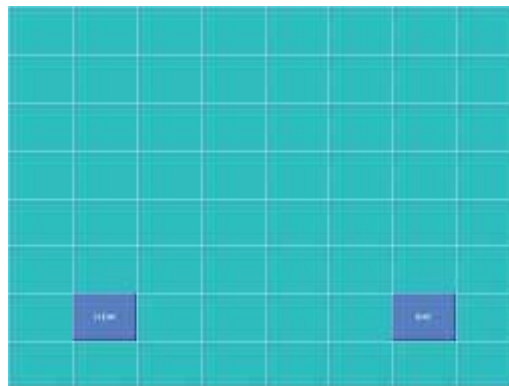
Correct 4 point locations on screen with the panel. Press on [Calibrate 4pt], screen displays as follows.



**Touch the blinking symbol on panel until beep or stop blinking.**  
There will be a message window after this correction.

### <Draw Test>

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



**Try to write or draw on it to verify the touch position.**  
Press **[CLEAR]** for cleaning touch screen, and press **[QUIT]** to exit **Draw Test**.

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Press [**Clear CalParam**] to clear the previous calibration records. The record will become default record.

#### <Calibrate 25pt>

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



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After the calibration, the new record will overwrite the old one.

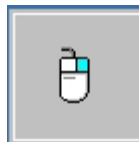
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Click mouse right button; there will be a pop-up box. Select **Button**, then a squared box shows up.



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.