DMC Co., Ltd.
Interface with Touch

Windows Embedded Compact7
Touchscreen Driver for multi touch v1.0
User Manual
DMC Co., Ltd.

Change History

Rev.	Date	Changed Content	PIC	Approved by
1.0	2012/1/20	First Issue	Kato	Takatsuki

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1. Introduction

1.1. Applicable Product

This documentation is a user's guide for the Touchscreen Driver for Windows Embedded Compact 7.

The Touchscreen Driver to be descrbied in this document can be only used with DMC's controllers, DUS Series. The driver supports no other controllers.

1.2. Development Environment

The development environment is indicated in the table1 below.

Table 1　Development Environment

Item	Content
Evaluation Board	Windows XP Service Pack2 or greater editions Windows Vista Service Pack2 or greater editions Windows 7
BSP	Adeneo Embedded Windows Embedded Compact 7 for FREESCALE iMX53QSB BSP V1.21
Development Environment	Microsoft Visual Studio 2008 SP1 or greater editions Windows Embedded Compact 7

Embed this touch screen driver into an already-installed BSP.
Regarding how to install a BSP, refer to the manual included in the BSP.

1.3. File Structure

The structure of the files used for the installation is indicated in the table2 below.

Table 2 File Structure

Item	Description	Note
copy_source.bat	Copy Batch File	
BSP/platform/CATALOG/		
UNITEC_DeviceDrivers.PbcXml	Platform Builder Catalog File	
BSP/platform/SRC/DRIVERS/TOUCH/UNITEC/		
CeTouchView/	Test Application	
common/	Multi-Touch HID Driver Source (Serial Mode)	
HID/		
Inc/		
BSP/platform/SRC/DRIVERS/USBHID/	Unitec Touch Panel Command Driver Source	
BSP/public/	USB HID Class Driver Modification Source (Modification for operating the Unitec Touch Panel Command driver)	

2. Install

2.1. Copying the File

Execute copy_source.bat and copy the files into the BSP.
Execute copy_source.bat directly from the Explorer.

Note : copy_source.bat will browse the original location by relative path. Execute copy_source.bat at the default location.

2.2. Editing the Dirs Files

Edit the two Dirs files.

❖ **WINCE700/platform/<BSP>/SRC/DRIVERS/TOUCH/dirs**

Note : <BSP> above indicates the name of the BSP in the copy destination. Replace <BSP> with the name of your using BSP: the same shall apply hereafter.

Add "UNITEC" directory to the DIRS keyword.

Example of editing:

```
DIRS=¥
    DRIVER_A ¥
    DRIVER_B ¥
    UNITEC
```

❖ **WINCE700/platform/<BSP>/SRC/DRIVERS/dirs**

Example of editing:

```
DIRS=¥
    DRIVER_A ¥
    DRIVER_B ¥
    USBHID
```

2.3. Editing the Registry File

Open the file below with an editor.

WINCE700/platform/<BSP>/FILES/platform.reg

Add the sentences below to end of the file above.

```
IF UNITEC_MTOUCH_HID
#include "$(_TARGETPLATROOT)¥src¥drivers¥touch¥unitec¥hid¥mtouch_hid.reg"
ENDIF

IF UNITEC_TOUCH_PANEL_CMD
#include "$(_TARGETPLATROOT)¥src¥drivers¥USBHID¥utchid¥utchid.reg"
ENDIF
```

2.4. Editing the Binary Image File

Open the file below with an editor.

WINCE700/platform/<BSP>/FILES/platform.bib

Add the sentences below to end of the file above.

```
IF UNITEC_MTOUCH_HID
#include "$(_TARGETPLATROOT)¥src¥drivers¥touch¥unitec¥hid¥mtouch_hid.bib"
ENDIF UNITEC_MTOUCH_HID !

IF UNITEC_TOUCH_PANEL_CMD
#include "$(_TARGETPLATROOT)¥src¥drivers¥USBHID¥utchid¥utchid.bib"
ENDIF UNITEC_TOUCH_PANEL_CMD !
```

3. Building

3.1. Selecting the Catalog Items

Open the project of the installed BSP and select the catalog.

1. Select the *.sln file from the menu below.

   File -> Open -> Project/Solution

2. Open the catalog view from the menu below

   View -> Other Windows -> Catalog Item View

3. Input the character strings below into"Catalog Item Search" (search box) on the lower right of the catalog view. Check the items you input.

   ➢ SYSGEN_GESTUREANIMATION
   ➢ SYSGEN_PHYSICSENGINE
   ➢ SYSGEN_TOUCHGESTURE
   ➢ UNITEC_MTOUCH_HID
   ➢ UNITEC_TOUCH_PANEL_CMD

Note : If the check box of the item you input is already green, It does not have to be checked. It is already enabled due to the dependency relations with other enabled items.

3.2. Building BSP

Open the Solution Explorer from the menu below.

   View -> Solution Explorer

Right-click the item below in the Solution Explorer to execute Build.

   C:/WINCE700/public/common/oak/drivers/usb/class/hid/hidclass

Build BSP from the menu below.

   Build -> Advanced Build Commands -> Sysgen

4. Software Calibration

Software calibration results will not be registered in the registry at startup of Compact 7.

The results will not be registered automatically. It will require the following procedures.

1. Connect the debug serial of the target board to the development PC, and open the appropriate serial by the terminal software on the PC.
2. Restart the PC, and complete software calibration. Display the desktop screen.
3. Check the logs from the terminal software and write down the numbers after "New Calibration data:"

PID:00400002 TID:0348001A New Calibration data: 510,250 175,126 165,372 703,393 704,115

4. Open the file below.

WINCE700/platform/<BSP>/SRC/DRIVERS/TOUCH/UNITEC/mtouch_hid.reg

Add the sentence below to the end.

[HKEY_LOCAL_MACHINE¥HARDWARE¥DEVICEMAP¥TOUCH]
   "CalibrationData"="510,250 175,126 165,372 703,393 704,115"

(Edit as "CalibrationData"="<the number string written down at the procedure 3 above>")

5. Reflect the setting to NK.bin from the menu below.

Build -> Make Run-Time Image

Note : "New Calibration data:" resulted by software calibration from the control panel will not be outputted on the logs from the serial port. To check the results of the software calibration, launch the auto-lunch software calibration.

5. CeTouchView(Multi-touch Test Tool)

CeTouchView is a test tool for the Compact 7 standard multi-touch driver. You may check gesturing operations visually with it.

5.1. Building

Embed CeTouchView according to the following procedures.

1. Open the file below.

   WINCE700/platform/<BSP>/SRC/DRIVERS/TOUCH/UNITEC/mtouch_hid.reg

   Add the sentences below to the end.

   ```
   [HKEY_LOCAL_MACHINE¥HARDWARE¥DEVICEMAP¥TOUCH]
       "DriverName"="CETouchFilter.dll"
       "DriverExName"="tchproxy.dll"
   ```

2. Open the file below.

   WINCE700/platform/<BSP>/SRC/DRIVERS/TOUCH/UNITEC/mtouch_hid.bib

   Add the sentences below to the end

   ```
   CETouchFilter.dll    $(_FLATRELEASEDIR)¥CETouchFilter.dll    NK SHK
   CETouchView.exe      $(_FLATRELEASEDIR)¥CETouchView.exe      NK U
   ```

3. Open the Build Window from the menu below.

   Build -> Open Release Directory in Build Window

   Move to the directory below

   WINCE700/platform/<BSP>/SRC/DRIVERS/TOUCH/UNITEC/CeTouchView

   Build with the command below.

   ```
   > build –c
   ```

4. Reflect to NK.bin from the menu below.

   Build -> Make Run-Time Image

Note : The contents embedded according to these procedures above are only for launching CeTouchView. This will be an overhead at normal usages. Do not embed this except for when launching CeTouchView.

5.2. Launching

Launch CeTouchView and configure the settings according to the following procedures.

1. Click the Start menu, go to "Run…", enter "cetouchview" to launch it.
2. Click "Option" on the lower left of the screen to launch the option dialog.
3. "Display Mode "Tab →"Options" check "Trailing", click the "OK" button to close the option dialog.

Note : At the procedure 1 above, the input focus will move to the edit box in the Run dialog, and the software keyboard will appear, then the entered characters will become non-visible. Because the Run dialog is not movable, move the software keyboard to check the entered characters.

5.3. How to Check

Touch operations and the according responses are indicated as below.

Touch Operation	Response	Gesture
Touch a location	Black dot will appear on the touched location	-
Touch a location with one finger and slide it slowly.	Red dots will follow the tracks of the sliding.	Pan
Touch a location with one finger and slide it quickly.	Green dots will follow the tracks of the sliding (1-point only)	Flick(Scroll)
Touch a location with one finger and hold it (no slide).	A cyan dot will appear on the touched location.	Hold(Right click)
Touch a location with one finger and release it at once.	A magenta dot will appear on the touched location.	Tap(Left click)
Touch a location with one finger and release it at once, touch the same location again immediately, and release it at once.	A yellow dot will appear on the touched location.	Double Tap (Double left click)
Touch a location with one finger, and touch another location with another finger. Slide either or both finger(s) and release the both fingers.	A circle whose diameter is between the two touched locations will appear (the center will be indicated with a red dot.)	Pinch

Note : For clearing the screen, open the option dialog and close it without doing anything.

6. Multi-touch Controller Support Status

6.1. Reporting Modes

Reporting Modes supported by this driver are indicated as below.

Name	Description	Support
Serial Mode	One touch information will be sent per packet	○
Parallel Mode	Maximum touch information will be sent per packet.	×
Hybrid Mode	Multiple touch information will be sent in one packet, and multiple packets will be sent when necessary.	×

6.2. HID Digitizers Specification

Usages of HID Digitizers supported by this driver are indicated as below.

Name	ID
Contact Identifier	0x51
Tip Switch	0x42
Contact count	0x54
Contact count maximum	0x55

6.3. VID/PID

USB VID/PID supported by this driver is indicated as below.

VID	0x0AFA
PID	0x07D2

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