



Capacitive Single Touch Drivers

General Functionality

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Related Documentation

[1] Capacitive Single Touch Driver, Setup and Installation for

1. Introduction

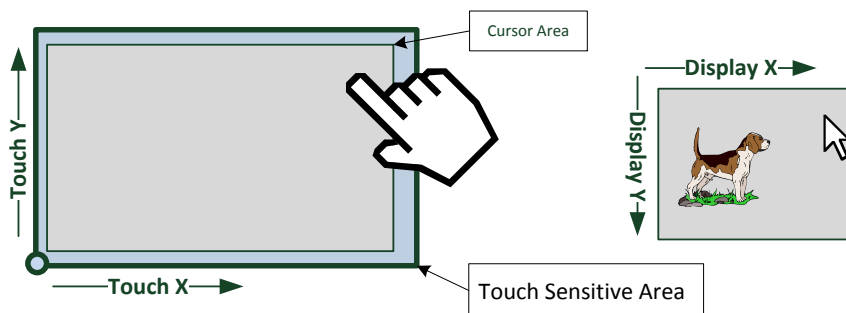
This document describes the general functions regards to the Toradex Capacitive Single Touch Drivers.

The installation of a Capacitive Single Touch Drivers supporting a specific Touch Panel and Touch Controller chip respectively is described in separate document (see [1]).

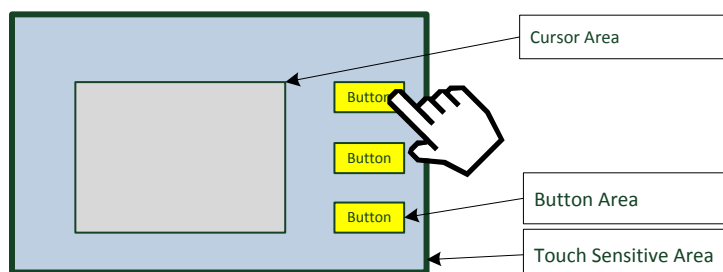
All Capacitive Single Touch Drivers has the same common functionality.

The key features of the Capacitive Single Touch Drivers are:

- The definition of a Cursor Area.
 - The Cursor Area can be smaller the the Touch Sensitive Area.
 - Touches inside this area are transformed to mouse events on the display.
 - The origins of the touch area and the display can be different.



- The definition of additional fixed Buttons.
 - If a Button Area is touched then the predefined key code is sent like this key is pressed on a keyboard.



2. Registry Setting

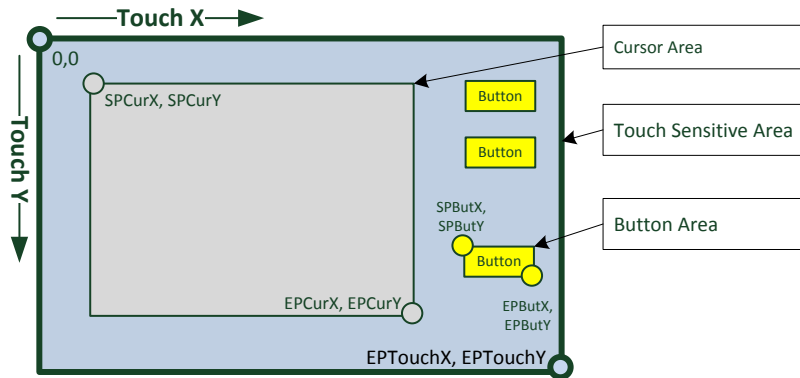


Figure 1 Touch Panel Layout

The Panel Definition is defined with the registry key

```
[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\SnglTchPanel]
```

with the values for:

- The size of the Touch Sensitive Area.
- The Cursor Area
- Button Areas (optional).
- The Touch Events

These registry settings are used by:

- Capacitive Single Touch Driver
- Capacitive Single Touch Driver Test Tool

2.1. Touch Sensitive Area

The size of the Touch Sensitive Area is depending on the used Touch Panel and the setup of the used Touch Controller Chip.

Normally, the Touch Sensitive Area (see Figure 1 Touch Panel Layout) and the setup of the Touch Panel/Controller are defined and documented by the manufacture of the display/touch product. The position of the origin, the mechanical dimensions and the maximal count of dots for the X and Y axis are shown in the datasheet of the Display/Touch product (please note the origin is not always on the upper left corner).

With this information the end point (EPTouchX, EPTouchY) can be defined and all other start and endpoint (e.g. Cursor Area) can be defined as fraction these end points.

Remark: The standard Touch Calibration Tweak Tool of Windows CE is not supported by this driver.

2.2. Cursor Area

It is possible to define a Cursor Area (see Figure 1 Touch Panel Layout) area to control the cursor on the display. Any finger movements within this Cursor Area are transformed to cursor movements on the display. The vertexes of the Cursor Area correspond to the vertexes of the display.

The start point (SPCurX,SPCurY) and the end point EPCurX, EPCurY are defined as fraction of the Touch Sensitive Area.

The orientation of the X and Y axis corresponds not always with the orientation of the display. Therefore it is possible to transform the orientation (see chapter 2.3/Order (7), Name "Transform").

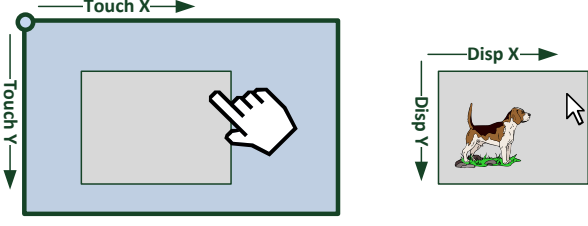
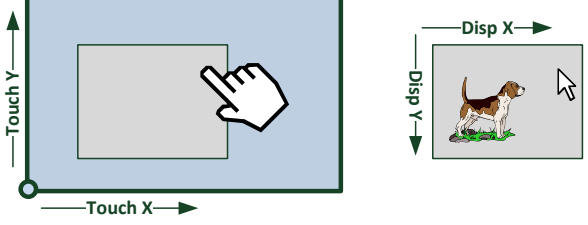
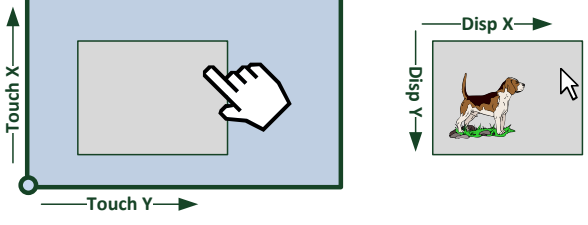
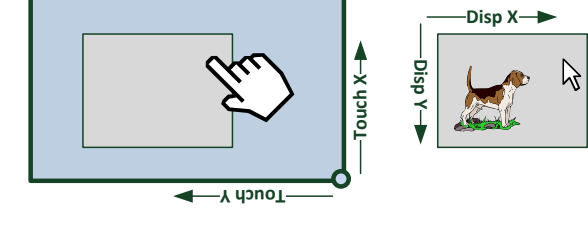
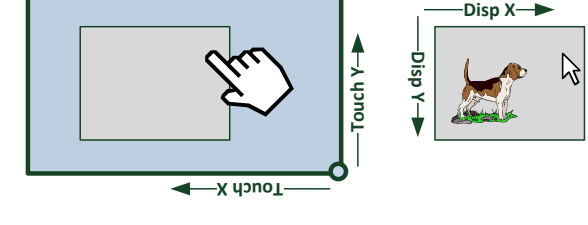
2.3. Definition of "CapTouchMapping"

The Touch Sensitive Area and the Cursor Area are defined with the registry value "CapTouchMapping".

"CapTouchMapping" is a comma separated string with 7 numbers:

```
"CapTouchMapping" = "799, 479, 36, 62, 634, 399, 0"
                    Order  (1)  (2)  (3)  (4)  (5)  (6)  (7)
```

Order	Name	Description
(1) (2)	EPTouchX, EPTouchY	The endpoint of the Touch Sensitive Area
(3) (4)	SPCurX, SPCurY	The start point of the the Cursor Area.
(5) (6)	EPCurX, ESPCurY	The end point of the the Cursor Area.

Order	Name	Description	
(7)	Transform	Value	
		0	
		1	
		2	
		3	
		4	

Order	Name	Description
5		
6		
7		

2.4. Button (optional)

If a finger touches one of the predefined Button Area ((see Figure 1 Touch Panel Layout) the the according ASCII code is sent. The behavior exactly the same like a key is pressed on the keyboard.

Configuration and functionality are similar like the resistive touch driver offers.

The coordinates of the Buttons Areas are given in touch controller coordinates and is normally outside of the Cursor Area.

The Buttons are defined in in the registry with the value

"TouchButtonX" X is a decimal number starts with "0" and can go up to "49".

"TouchButtonX" is a comma separated string with 5 numbers:

" TouchButton0" = "500, 100, 599, 179, 27"
Order (1) (2) (3) (4) (5)

Order	Number Name	Description
(1) (2)	SPButX, SPButY	The start point of the the Button Area
(3) (4)	EPButX, EPButY	The endpoint point of the the Button Area
(5)	Key Code	ASCII code to send if the Button is hit by finger

For example the Buttons in the layout of of chapter 2.1 are defined as:

"TouchButton0"="500,100,599,179,27"

"TouchButton1"="500,200,599,279,65"

"TouchButton2"="500,300,599,379,66"

2.5. Mouse Events

The kind of the Mouse Events can be influenced by two registry values:

"MouseEmulation" and "TouchEmulation"

If the "MouseEmulation" is enabled (any other values than zero) then finger touches in the Cursor Area causes the following events:

- "MOUSEEVENTF_LEFTDOWN" for a finger touches the panel.
- "MOUSEEVENTF_LEFTDOWN" and "MOUSEEVENTF_MOVE" for the finger moves.
- "MOUSEEVENTF_LEFTUP" for the finger lift up.

If the "TouchEmulation" is enabled then finger touches in the Cursor Area causes the following events:

- Every finger touch and move causes a "MOUSEEVENTF_TOUCH" event.

More information can be found on MSM

<http://msdn.microsoft.com/en-us/library/ms931453.aspx>

The following example turns the mouse emulation on and the touch emulation off.

```
"MouseEmulation"=dword:00000001  
"TouchEmulation"=dword:00000000
```

2.6. Example of all Registry entries for the Panel Definition

[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\SngrTchPanel]

```
"MouseEmulation"=dword:00000001  
"TouchEmulation"=dword:00000000  
"CapTouchMapping"="799,479,36,62,634,399,0"  
"TouchButton0"="500,100,599,179,27"  
"TouchButton1"="500,200,599,279,65"  
"TouchButton2"="500,300,599,379,66"
```

3. Features not supported

Currently the Capacitive Single Touch driver does not support all features of the resistive touch.

- The standard Touch Calibration Tweak Tool of Windows CE is not supported by this driver.
- Wake up a Colibri Modul with touching the panel is not implemented.

Revision History

Date	Changes
28.Dec-12	Initial release
25.Mrz-13	Reworked to a general description without touch controller specific chapters

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