



# Capacitive Single Touch Drivers

## Setup and Installation

Touch Controller:  
PXCIR, Tango C48

Touch Panel:  
DATA IMAGE / SCF700C48GGU06

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## Related Documentation

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- [1] Capacitive Single Touch Driver, General Functionality
- [2] GPIO Config Tool <http://developer.toradex.com/knowledge-base/gpioconfig>

## 1. Introduction

This document describes the setup and test of the hardware interface to the touch panel DATA IMAGE/SCF700C48GGU06 containing a Touch Controller Tango C48 from PIXCIR.

The General Functionality of the driver is described in [1].

## 2. Register Settings for the Interface

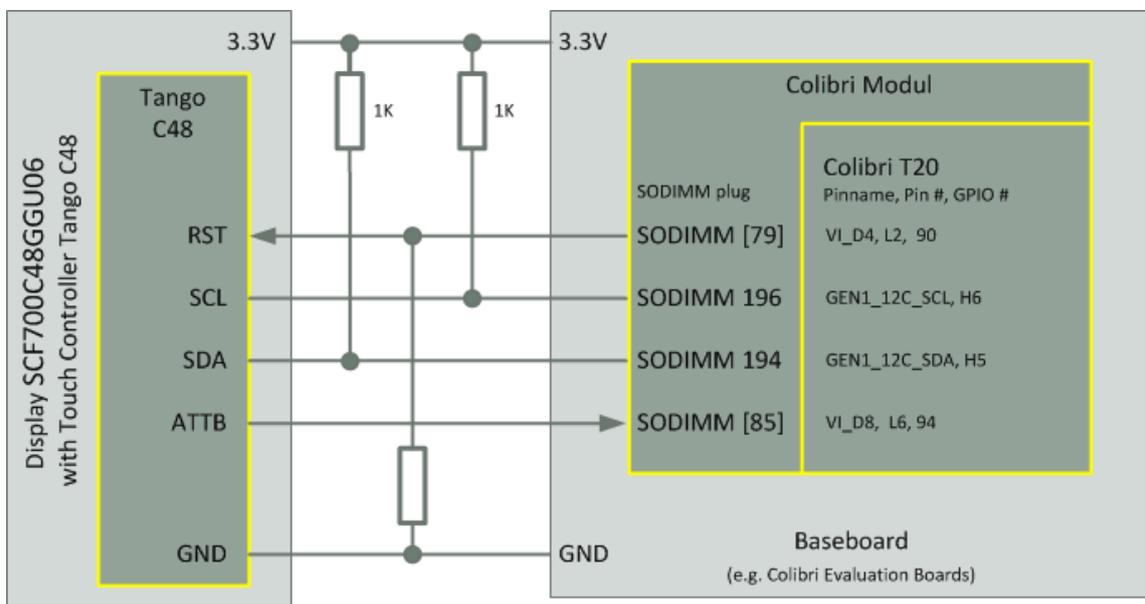


Abbildung 1 Interface to Capacitive Touch Panel with IC Tango C48

Beside the I2C bus connection the touch panel needs the line RST to reset the touch panel and the line ATTB to signal an interrupt the touch driver.

The SODIMM Pins of the Colibri Modules for these two lines can be defined in the registry. Additionally the active level of these two signals and a delay can be defined too (to adapt some logic on the Baseboard).

All these settings are defined with the registry key:

`[HKEY_LOCAL_MACHINE\Drivers\BuiltIn\TangoC48]`

The following values can be used:

<b>Int_SODIMMPin</b>	Defines the SODIMM Pin # for the ATTB signal from the Tango C48.
<b>Int_Signal_Inv</b>	The active level of the ATTB signal is described in the datasheet of the touch panel. This value inverts the active level to adapt level shifter, amplifier etc. on the Baseboard. 0 = not inverted, 1 = inverted.
<b>Reset_SODIMMPin</b>	Defines the SODIMM Pin# for the RST signal to the Tango C48. Another way is to use this signal to switch the power of the Tango C48 on and off (maybe in case of EMC issues, power off and on is a better way than a reset signal).
<b>Reset_Line_Inv</b>	The active level of the RST signal is described in the datasheet of the touch panel. This value inverts the active level to adapt power switches etc. on the Baseboard. 0 = not inverted, 1 = inverted.
<b>Reset_Post_Delay</b>	This value can be used to define the delay between the end of the active RST signal and the first communication over the I2C bus. X = delay in ms
<b>I2CSpeed</b>	Speed of the I2c communication 1=100KB, 2= 400KB.
<b>I2CAddress</b>	I2C address of the Tango C48 controller.

The following default values are use if the value is missing in the registry:

<b>Int_SODIMMPin</b>	[85]
<b>Int_Signal_Inv</b>	[0]
<b>Reset_SODIMMPin</b>	[79]
<b>Reset_Line_Inv</b>	[0]
<b>Reset_Post_Delay</b>	[100]
<b>I2CSpeed</b>	[0]
<b>I2CAddress</b>	[0x5C]

## 2.1. Example of all Registry entries

### [HKEY\_LOCAL\_MACHINE\Drivers\BuiltIn\SngTchPanel]

```
"MouseEmulation"=dword:00000001  
"TouchEmulation"=dword:00000000  
"CapTouchMapping"="799,479,0,0,799,479,0"  
"TouchButton0" = .....
```

### [HKEY\_LOCAL\_MACHINE\Drivers\BuiltIn\TangoC48]

```
"dll"="sngltchdrv_tangoc48.dll"  
"prefix"="TCH"  
"index"=dword:00000001  
  
"Int_SODIMMPin"=dword:00000055  
"Int_Signal_Inv"=dword:00000000  
"Reset_SODIMMPin"=dword:0000004F  
"Reset_Post_Delay"=dword:00000064  
"Reset_Line_Inv"=dword:00000000  
"I2CSpeed"=dword:00000002  
"I2CAddress"=dword:0000005c
```

- █ Red line: Values for the Panel Definition (see [1])
- █ Blue line: Values for loading the driver
- █ Green line: Values for the Interface setup

### The file

TangoC48\_ToolDrv.reg

contains a base register setting without the values for loading the driver (red line).

This file can be modified and imported in the registry (double click on the file).

These registry settings is used by

Capacitive Single Touch Driver

and partly by

All Capacitive Single Touch Driver Tools

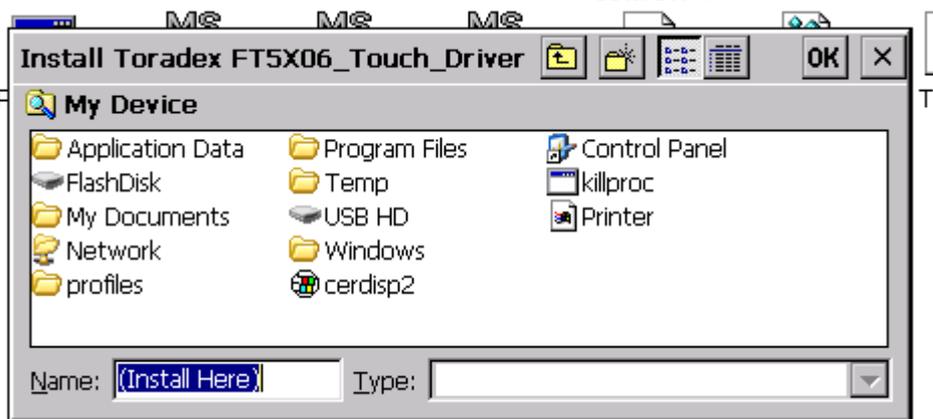
### 3. Install the Single Touch Driver

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Before installing this driver no other Single Touch Driver should be installed (see chapter 4).

To Install the driver copy the File “SingleTouchDriverTangoC48.cab” to a Colibri (Desktop, Temp folder etc.) and execute it.

The following screen is popping up.



After confirm (OK button) the driver file “sngltchdrv\_tangoc48.dll” is copied to “\FlasDisk\System\” and all necessary entries in the registry are made.

Save the registry before reboot (Start->ColibriTools->SaveReg).

**Remark:** Install or reinstall the driver overrides only the settings for loading the driver (see blue line in chapter 2.1). The other registry entries are not changed or must be adapted to your display/touch and interface.

## 4. Uninstall the Single Touch Driver

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To uninstall the driver use:

“Start->Settings->Control Panel->Remove Program”.

**Remark:** If you reinstall the driver the settings for load the driver are removed (see blue line in chapter 2.1).

The other register settings are unchanged and must be removed manual with a registry editor if needed.

## 5. Capacitive Touch Driver Tools

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For testing the hardware and the registry settings are several tools available:

- TangoC48\_I2CAdrScan.exe Scan the I2C bus to detect all active device
- TangoC48\_ContrlTest.exe Show the RAW touch coordinates from the Touch Controller
- TangoC48\_Calibration.exe Calibrate the Touch Panel
- TangoC48\_DriverTest.exe Test all settings

All these tool runs as an application and can be started from the desktop without any installation. The tools use all or some settings of the registry which should be made in advanced (see below).

### Remark:

It is not possible to run these tools together with Capacitive Single Touch Driver. In this case the driver must be uninstalled first.

If this tools are closed regular (ESC and or Enter) then the tools can be run again. Otherwise the Colibri Modul needs to be restarted.

### 5.1. TangoC48\_I2CAdrScan.exe

This tool reset the Touch Panel using the line RST and the according settings in the registry. After the reset sequence the tool send out all I2C addresses and waits for a response. Addresses with a valid acknowledge are shown on the screen.

This tools use the registry settings for the interface (see green line in chapter 2.1).

## 5.2. TangoC48\_ContrlTest.exe

This tool reset the Touch Panel using the line RST and the according settings in the registry. After the reset sequence the tool initialize the touch controller and waits until a finger touches the panel.

If the touch controller signals an activity on the touch panel with the ATTB line the the tool reads out the touch position and display it on the screen.

The displayed coordinates are in RAW format of the touch controller.

This tool show only single touches.

This tools is very helpful for compare the resister settings for the Panel definition (see [1]) with the RAW position of the touch panel.

This tools use the registry settings for the interface (see green line in chapter 2.1).

## 5.3. Tango\_Calibration.exe

This tool resets the Touch Panel using the line RST and the according settings in the registry. After the reset sequence the tool activate calibration sequence. This calibration should be done one time after the touch panel and display are assembled. For more details consider the technical data of the touch controller Tango C48 and/or the manufacture of the unit.

This tools use the registry settings for the interface (see green line in chapter 2.1).

## 5.4. TangoC48\_DriverTest.exe

With this tool the setting for the driver can be tested because it works with the same registry settings like the real driver does (except the values for loading the driver DLL).

After start the Driver Demo reads out the registry settings and prints out some status message on the same port like the bootloader does (to connect to the Bootloader port you need: a Null Modem Cable a PC with a serial com port (RS232) a terminal application (e.g. HyperTerminal or TeraTerm).

On the standard display is no output from the Driver Test at all.

The demo reads out the capacitive touch panel IC Tango C48 and generates the according mouse events. If mouse emulation is set in the registry the cursor on the display should following a touching finger.

This tools use the registry settings for the interface (see green line in chapter 2.1) and the Panel definition (see red line in chapter 2.1).

## 6. Bring up the connection to the Touch Panel

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After the Hardware connection is setup (I2C Bus, ATTB and RST are connected) the following steps and tools helps to bring up the device:

- Set the register values for the Interface at least (see green line in chapter 2.1).
- Control the settings and wiring of the RST and ATTB lines.
  - With the help of the GPIO Config Tool [2] the chosen SODIMM pin can monitor and set respectively.
- Run the Tool to scan the I2C Addresses (`TangoC48_I2CAdrScan.exe`).  
The tool shows the I2C Addresses of all devices on the I2C bus. On of these addresses should be the address of the touch controller.  
Please note the shown addresses are the addresses of the devices on the I2C bus and not addresses set in the registry.
- Run the Tool to test the touch controller (`TangoC48_ContrlTest.exe`).  
The tool establishes the communication to the touch controller. In case of an error the tool retries it.  
If the communication is ok the the tools waits until a finger touches the panel and shows it position.
- The show position can be used set or verify the register settings for the Panel Definition (see red line in chapter 2.1).
- Set the register values for the Panel Definition (see red line in chapter 2.1).
- Run the tool to test the driver settings (`TangoC48_DriverTest.exe`).
- If mouse events are enabled the cursor on the screen should jump to the position of touching finger. If the finger moves on he touch panel then the cursor should following it.
- If anything works the install the driver (see chapter 3).

### Revision History

Date	Changes
28.Dec-12	Initial release
25.Mrz-13	Reworked to a touch controller specific description without the general chapters
29.May-13	Changed the driver installation path to work with Win CE7, Beta 1.1 and later

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