Getting Started with CapTouch Shield board with LPCXpresso804 board

Software & Tools

- Keil ARM/IAR/MCUXpresso IDE (with the version supporting LPC804/LPC80x chip)
- Freemaster Tool (optional, can be used to monitor the run-time sensing value)
- Sample Code for CapTouch application on LPCXpresso 804
- LPCXpresso 804 board Rev2/RevB and CapTouch Shield board Rev2/RevB (OM40001)

Hardware & Board Settings

To enable the CapTouch application, the hardware should make sure all the related lines for CapTouch (X pads, YL and YH) are clean without any pull-up/down resistors, capacitors and other component on LPCXpresso 804 board.

Jumper	Setting	Comment
JP21	Disconnected	Shared with LED D4
JP22	Disconnected	Shared with LED D3
JP23	Disconnected	Shared with I2C SDA for I2C Temperature
JP25	Disconnected	Shared with LED D2
JP6	No jumper	Shared with dual power usage
JP3	Disconnected	Shared with SPI CS. Only necessary for ACMP mode.

Make sure C13 on LPCXpresso 804 board is removed, as it attached on the YL line for CapTouch.
Make sure the R6 on CapTouch Shield board is removed, as the ACMP mode for CapTouch is not used in this demo. R6 should be shorted when enabling the ACMP mode for CapTouch in more flexible usage. In this case, the JP3 should be disconnected as well.

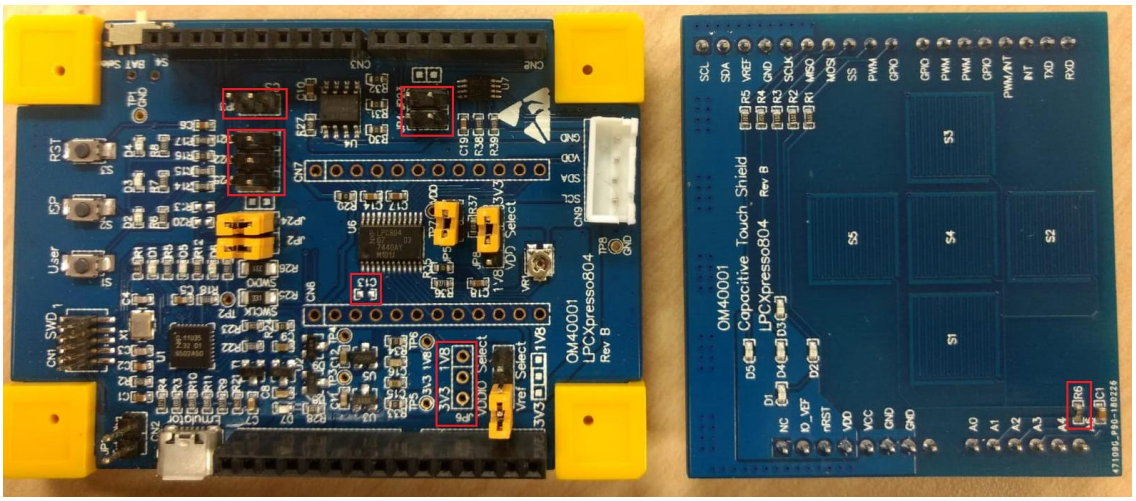

Figure 1 Jumper and resistor settings

Running the Demo

1. Check the hardware settings and assemble the LPCXpresso 804 board and CapTouch Shield board.
2. Connect the LPCXpresso 804 and PC with USB Cable (the only microUSB interface CN2 on board)
3. Build the project, download the image and reset the LPCXpresso804 board.
4. Run the Freemaster project to monitor the sensing value in run time.

After reset, all the 5 LEDs would be On and Off one by one, and flash together. Please do not touch the pads during this period. After all the LEDs are silent, touch any pad and the responding LED will be on until your finger moves away.

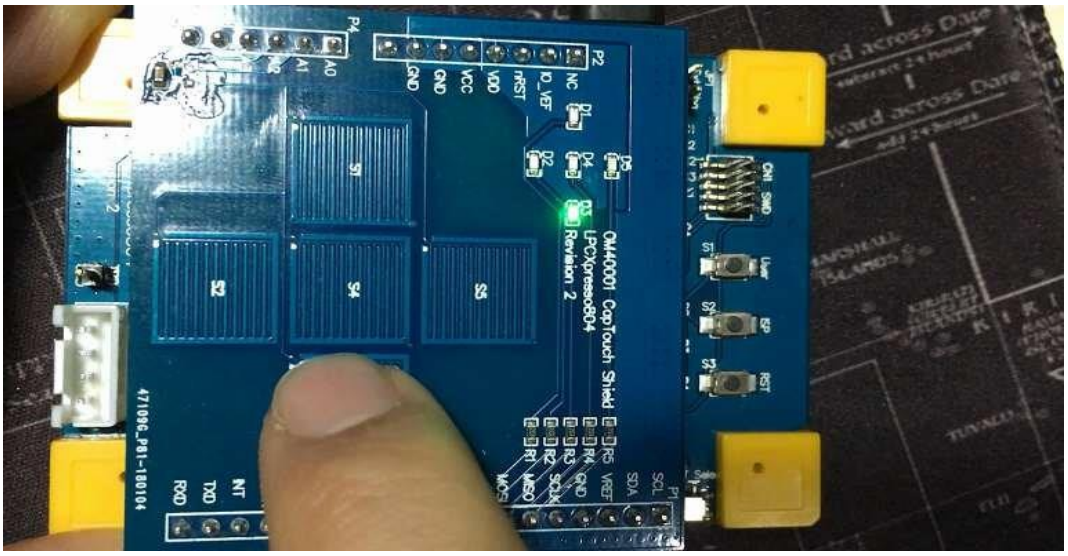

Figure 2 Touch the pad and turn on the corresponding LED

Monitor the sensing values in run-time:

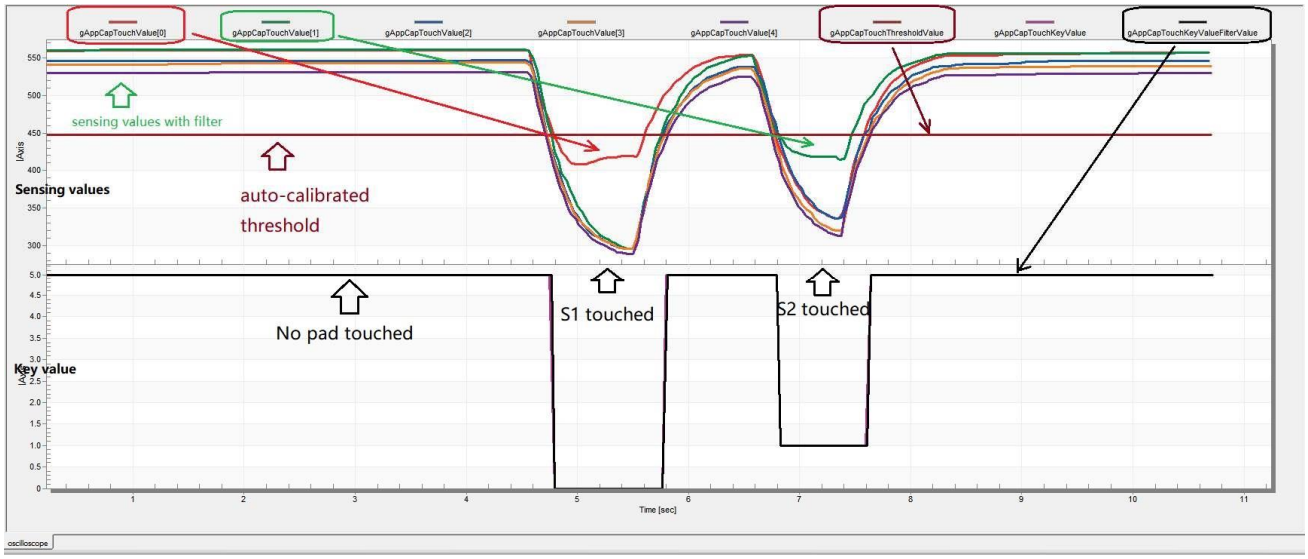

Figure 3 Waveform of sensing value and key value

Known Issue

- To ensure correct operation of CapTouch, make sure the power source can be battery or clean enough on ground and the touch strength be stronger. However, in the most cases, the filters in the example would suppress the noise as well.
- If the corresponding LED is not turn on/off according to the right touch pad, please press harder with your finger, so that there would have enough sensing area on the pad. In the actual product design, the size of pads should meet the size of touch area, that is, the size of a finger's top.

Change Log

This log applies for all the CapTouch examples in the LPC804 CodeBundle package.

v1, released within LPC804_CodeBudnle v1.4
- Initial version
- This version is the simplest one to enable the CapTouch feature with most simple code.

v2, released within LPC804_CodeBundle v1.6
- Add the algorithm of delta filter to process the sensing value, and reduce the noise in original sensing values.
- Add the algorithm of anti-rebounce filter to process the detected key value, and make the detected key value more stable.
- Add the algorithm of auto calibration method to learn the threshold value of detection automatically according to different environment condition.
- Reconstruct the main function, which is the top-level code of application, to optimize the control logic to LEDs.