RX210

Touch & LCD Sample Code

R01AN1814EG0100
Rev.1.00
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Introduction

This application note describes how the glass LCD and Touch keys can be interfaced using I/O port lines.

Target Device

RX210

Development environment

IDE: HEW

Compiler: Renesas RX v1.02.01.000

Hardware: Renesas Starter Kit for RX210

Contents

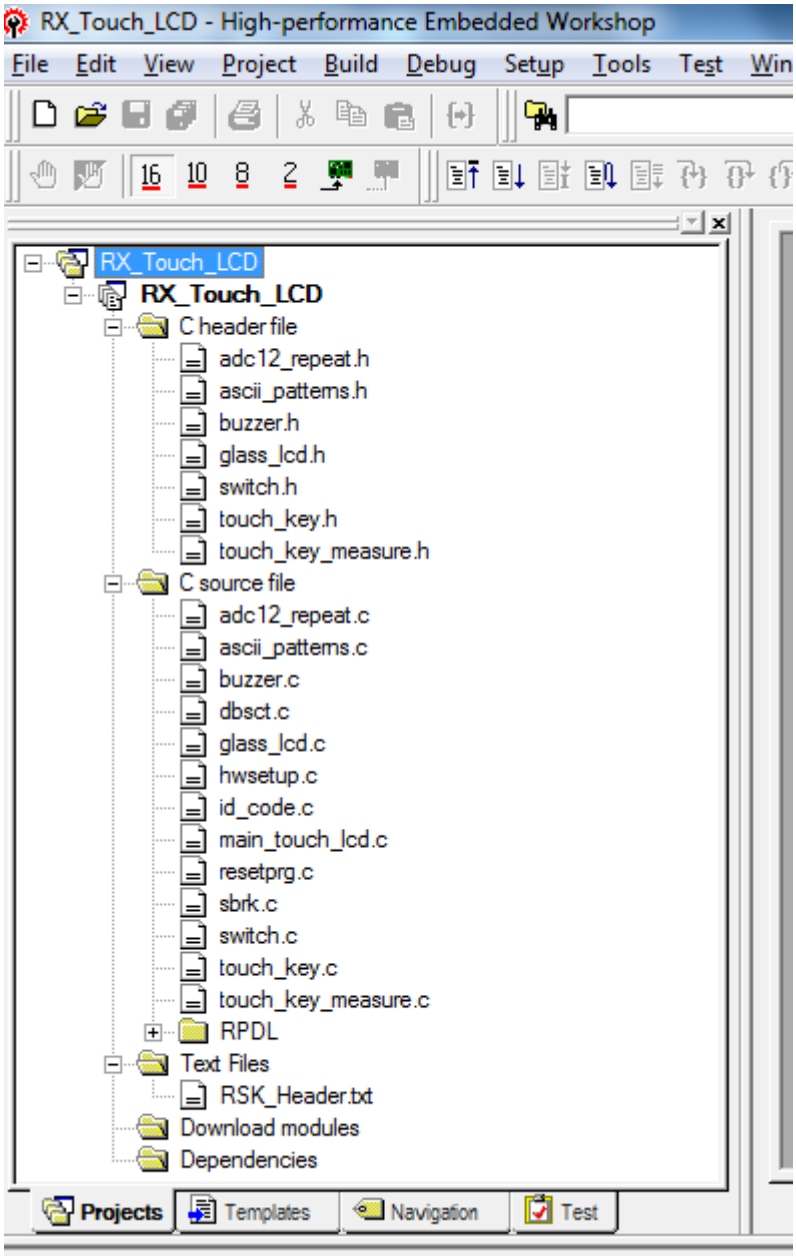
1. Opening the sample code workspace

The RX LCD Touch sample code is supplied as a Hi-performance Embedded Workshop (HEW) workspace with the file ‘an_r01an1814eg0100_rx200_lcd.zip. This workspace should be copied to a suitable folder on your PC and extract the ‘an_r01an1814eg0100_rx200_lcd.zip.zip’ file. The default location that HEW will look for workspace files is c:\workspace.

Once copied to a suitable location the workspace can be opened by double clicking the file “RX_Touch_LCD.hws” or within HEW from the File | Open Workspace menu itemLoading the selected sample code project

2. Loading the selected sample code project

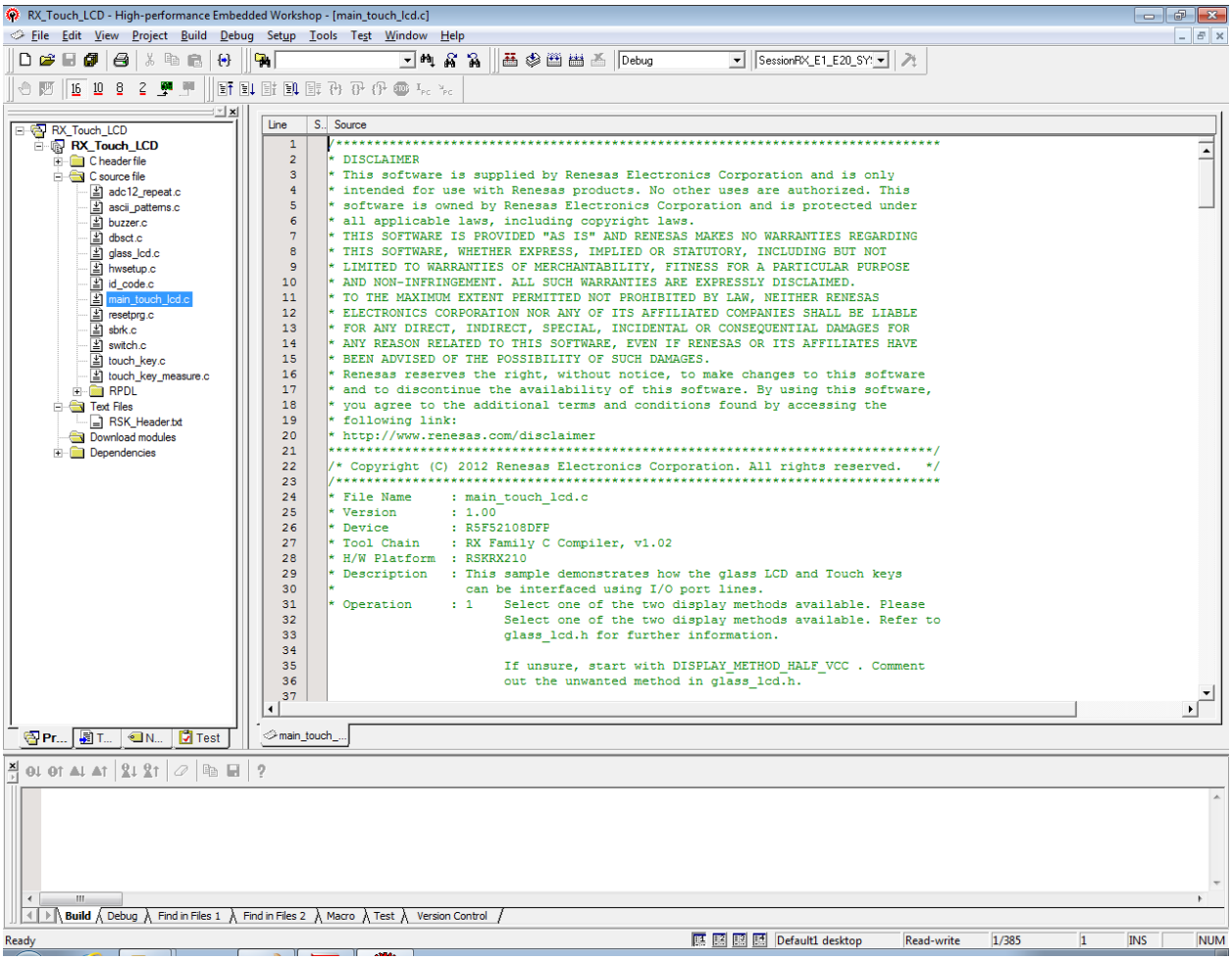
Within the workspace there are a number of separate projects. Each project contains the source files for the specific peripheral sample code.
Once the workspace is loaded into HEW the required sample project must be loaded before you can be open the source files. From the Project | Set current project menu item select the required project name



Example

3. Opening Sample Code and Source Files

Once the project is loaded the source code and all dependant files can be opened in the editor by double clicking the file in the workspace window.



Example

4. Source Code Functionality

Each source code project is specifically written to run on the appropriate RSK. However this source code can be useful as an example of peripheral initialization even without the RSK.

Each sample project will contain a C source file that includes “main” in the name, for example “main_adc12_oneshot.c”. This source file will include the C function main() as well as a comment block that describes the function of the sample code.

5. Appendix

Example of comment block with code functionality

/**

* File Name : main_touch_lcd.c

* Version : 1.00

* Device : R5F52108DFP

* Tool Chain : RX Family C Compiler, v1.02

* H/W Platform: RSKRX210

* Description : This sample demonstrates how the glass LCD and Touch keys can be interfaced using I/O port lines.

Operation: 1 Select one of the two display methods available. Please

Select one of the two display methods available. Refer to glass_lcd.h for further information. If unsure, start with DISPLAY_METHOD_HALF_VCC . Comment out the unwanted method in glass_lcd.h.

2 Ensure that TOUCHKEY_DEMO is defined and TOUCHKEY_MEASURE is commented out.

3 Build the project by selecting Build->Build All.

4 Ensure that the adaptor board is correctly connected to your RSKRX210 board. J1 (adaptor) should be

placed on top J1 of the RSKRX210 board. Power ON the board.

5 Click on Connect icon to make the connection with your debugger.

6 Download the file by selecting the RSKRX210TouchLCD.abs file and pressing right key to select

'download'.

7 Select Debug ?Reset Go or click on Reset Go icon or press Shift F5 to run the sample.

8 The display should show the message 'RENESAS – PRESS A KEY' in scrolling mode.

Adjust the pot RV1 to set the desired contrast.

9 Touch switch 1 or 2 and the display will show if the key is pressed. The buzzer should also beep. When

the key is released, the display will revert back to the original message.

10 Touch switch 3 and the display will display KEY 3. When released, it will display the contrast value in

percentage. Adjust the pot and the value will change. The contrast value can be fine-tuned and set as

default.

11 Touch switch 3 again and the unit will revert back to original message. Switch 3 toggles between

original message and contrast value.

You can try out display method DISPLAY_METHOD_DOUBLE_PULSE by selecting this and commenting

out DISPLAY_METHOD_HALF_VCC. Rebuild the code and follow the above instructions.

Note: The contrast setting will be different for this method.

RISE TIME MEASUREMENT

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This sample code also allows you to measure the rise time of the

Touch Key RC circuit.

1 Comment out TOUCHKEY_DEMO and select TOUCHKEY_MEASURE.

2 Rebuild the project and run it. The display will continuously display the rise time of SW1. Touch the key

and observe the increase in the rise time. The rise time information can be used for the key check.

3 Press SW2 on the RSKRX210 board (bottom left side next to the pot). The rise time for touch SW2 can now be measured. Similarly, press SW3 of the main board and measure the rise time for touch SW3.
Note: The keys SW1 - SW3 on the main board are from right to left, whilst on the touch boards are from left to right.
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Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	Jan 06, 2014	-	First edition issued

General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

   Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed. In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

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   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of an MPU or MCU in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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