RL78/G13

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Renesas Starter Kit Sample Code for Cubesuite + Toolchain

Introduction

Renesas Starter Kits (RSK) are supplied as complete development systems for the selected microcontroller. The kit includes an evaluation board, portable On-Chip Debugger and a set of peripheral sample code.

Target Device

RL78/G13

Contents

1. Opening the sample code workspace

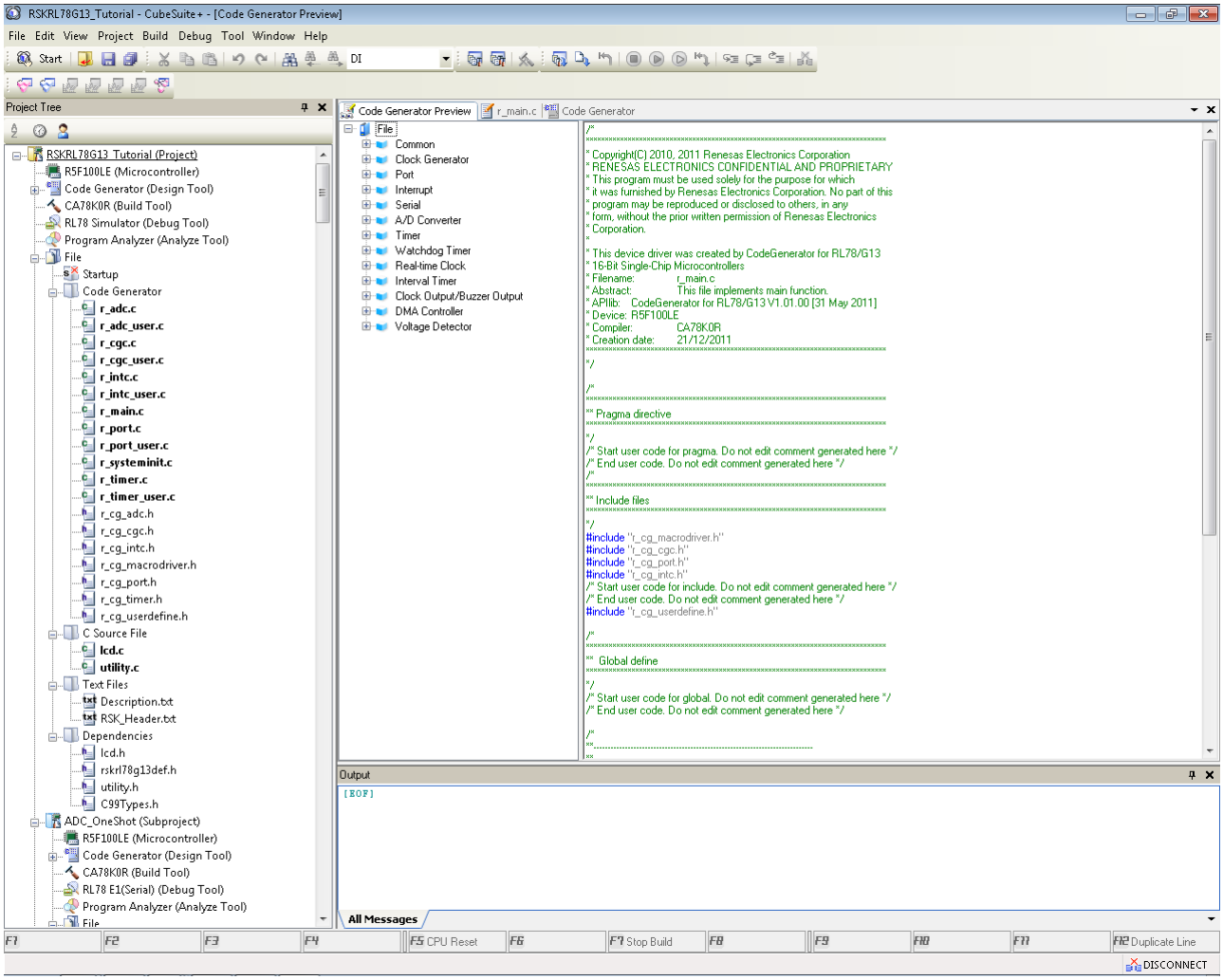
The CubeSuite+ IDE should already be installed on the user's personal computer (PC). The RSK sample code is supplied as a CubeSuite+ sample RSK project. This workspace should be copied to a suitable folder on your PC.

Once copied to a suitable location the sample RSK project can be opened by double clicking the file "RSKRL78G13_Tutorial.mtpj" or within CubeSuite from the Project | Open Project… menu item.

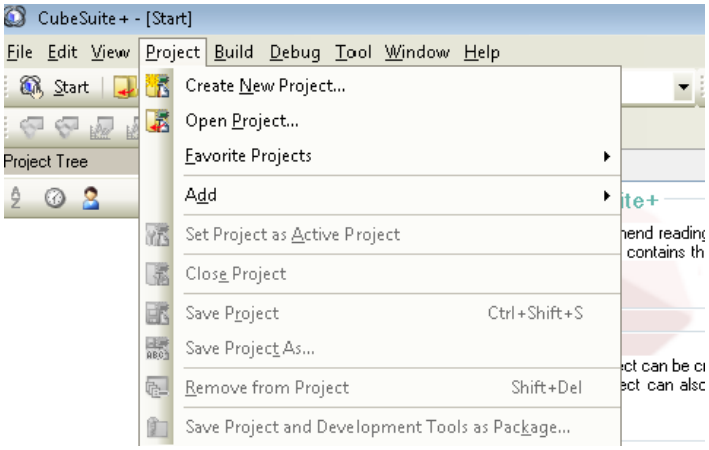
2. Loading the selected sample code project

Within the workspace there are a number of separate projects. Each project contains the source files for the specific peripheral sample code. Open CubeSuite+ IDE by clicking the Windows Start button select All Programs > Renesas Electronics CubeSuite+ > CubeSuite+.

Once the workspace is loaded into CubeSuite+ the required sample project must be loaded before you can be open the source files.

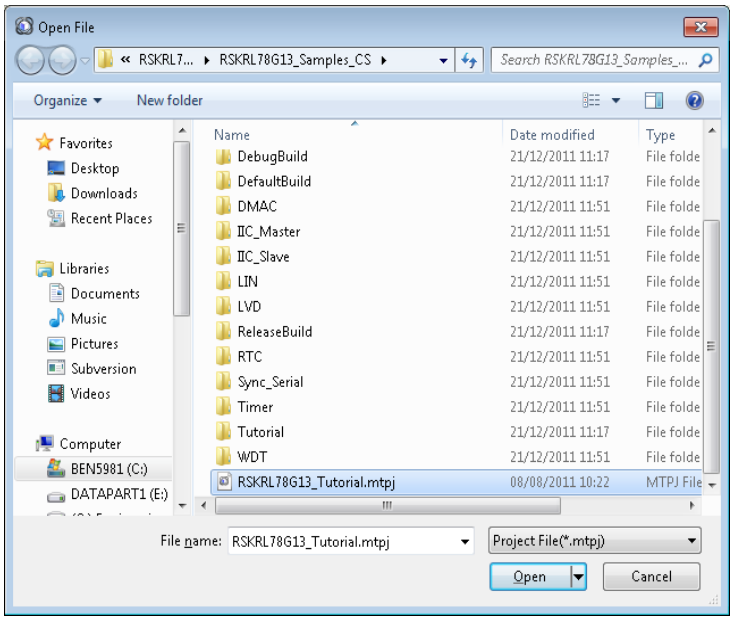


From the menu bar select Project > Open Project…

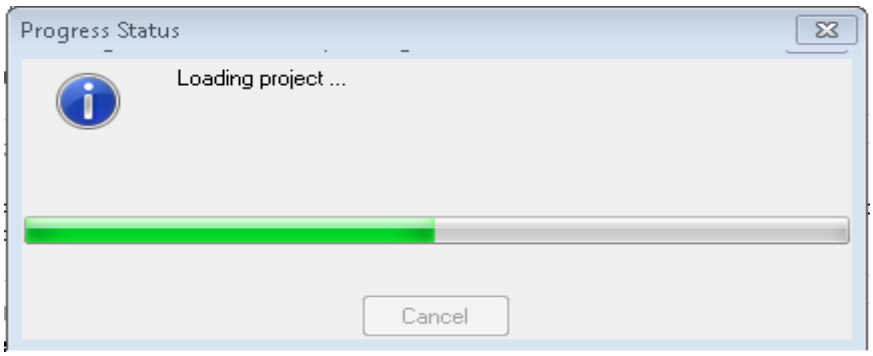


CubeSuite+ will open a dialog. Navigate to the unzipped RSKRL78G13_Samples_CS folder.

Select the RSKRL78G13_Tutorial.mtpj file. Click <Open>.

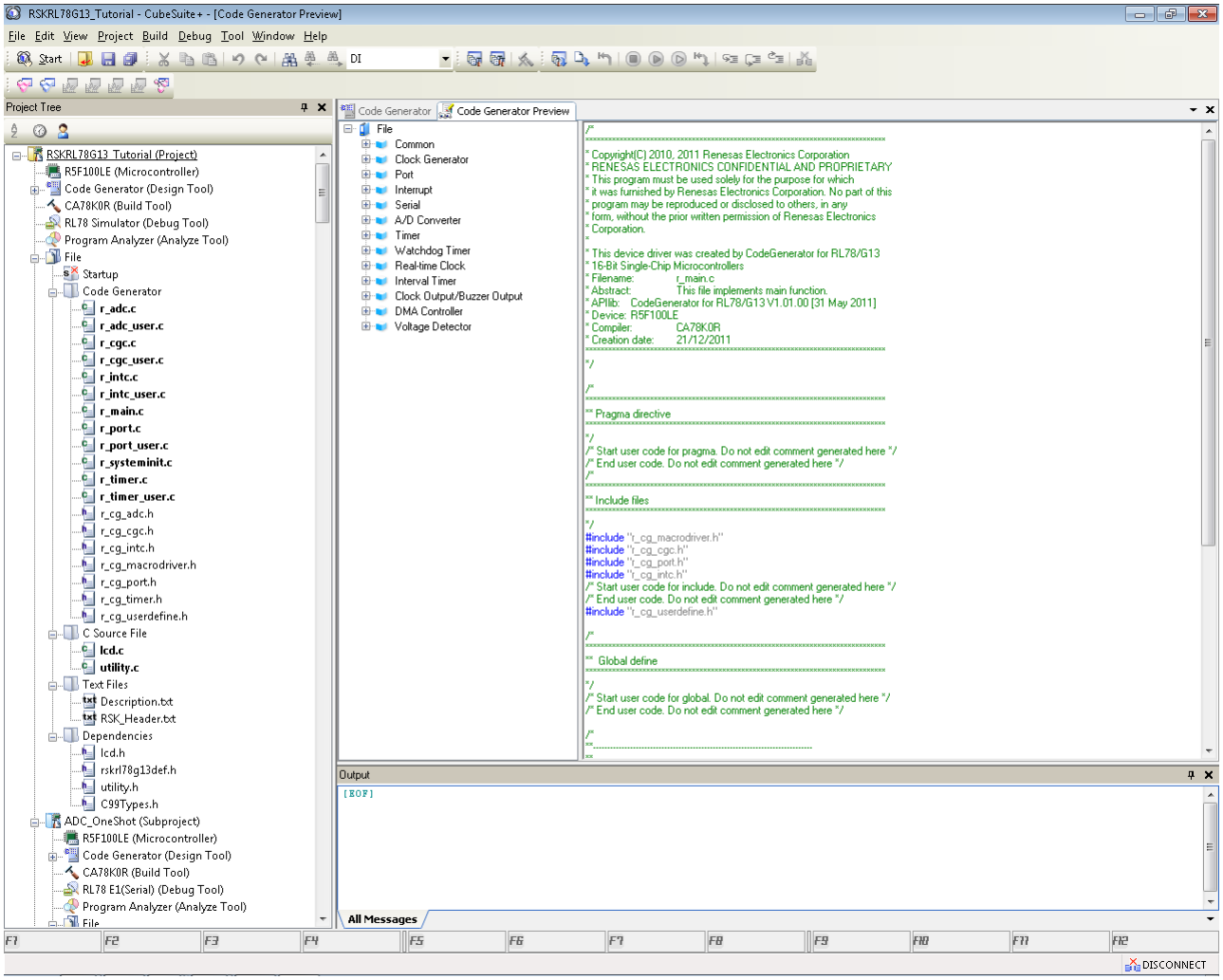


A Progress Status dialog will appear briefly whilst CubeSuite+ loads the project.



3. Opening sample code source files

Once the project has been opened, the source code and all dependant files can be opened in the editor by expanding the folders in the Project Tree window and double clicking the files listed. All files have been grouped according to their file type.



Example

Each source file listed in Project Tree window in CubeSuite+ can be expanded to reveal its dependant files ; as well as the output files.

From the Project Tree window to select the project, for example, “ADC_OneShot”, select “ADC_OneShot” Project in the Project Tree window. Then select Project |“Set ADC_OneShot as Active project” menu item to make the “ADC_OneShot” project the current project.

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 “r_main.c” in the name, for example “r_main.c”. This source file includes the C function main(). All source files and dependant files whose filenames are prefixed with ‘r_’ were generated using Code Generator.

5. Appendix

Example of comment block with code functionality

```
/*********************************************************************************
* Project    : ADC_OneShot
* Version  : 1.00
* Device    : R5F100LE
* Compiler              : CA78K0R
* H/W Platform        : RSKRL78G13
* Description   : Demonstration of the ADC module, in oneshot mode. The program
*                         configures the ADC to perform A/D conversions after a switch
*                         press and displays the results on the debug LCD. The user can
*                         switch between 8-bit and 10-bit precision modes by pressing user
*                         switches.
* Instructions :        1. Compile the sample code, and download to the RSK. Click the
*                         'Restart' button to start program execution. Instructions will be
*                         displayed on the LCD.
*                        2. Observe the LCD display - the RL78G13 will make an ADC reading
*                         of the potentiometer, RV1, after pressing SW1 and displays the 10-bit
*                         value on the debug LCD.
*                         3. Adjust the setting of the potentiometer, press SW1 to observe the change
*                         in the value.
*                         4. Press SW2 to change the conversion precision to 8-bit. Pressing SW3 to
*                         revert back to 10-bit precision.
*                         5. The user may examine the ADC conversion result in the global variable
*                         gADC_Result.
*           NOTE: If the power supply in use is not filtered enough, you may notice some variations
*                         in the displayed ADC result when the application is executed more than once.
*********************************************************************************/
```

6. Website, Inquiries and Support

Renesas Electronics Website

http://www.renesas.com/

Inquiries

http://www.renesas.com/inquiry

Support

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Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Jan 27, 2012	—	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 manual, refer to the relevant sections of the manual. If the descriptions under General Precautions in the Handling of MPU/MCU Products and in the body of the manual differ from each other, the description in the body of the manual takes precedence.

1. Handling of Unused Pins
   Handle unused pins in accord 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.
5. Differences between Products
   Before changing from one product to another, i.e. to one with a different type number, confirm that the change will not lead to problems.
   — The characteristics of MPU/MCU in the same group but having different type numbers may differ because of the differences in internal memory capacity and layout pattern. When changing to products of different type numbers, implement a system-evaluation test for each of the products.

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