

RZ/A1H Group

R01AN3087EG0100

Rev.1.00

Renesas Starter Kit+ FreeRTOS Sample Code for e2 studio

Oct 14, 2016

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

RZ/A1H

Development environment

IDE: e² studio v4.0.1

Compiler: GNUARM-NONE v14.02

Hardware: Renesas Starter Kit+ for RZ/A1H

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1. Hardware Compatibility

The sample code provided in this Application Note should only be used with compatible revisions of the Renesas Starter Kit+ for RZ/A1H hardware. Inspect the board identification label for compatibility as shown below;

Board ID	Description	Action
D012221#01 D012221#02 D012221#03 D012221#04	Needs NOR and QSPI bootloader update	See section 6 for bootloader update instructions.
D012221#0410 or later	NOR and QSPI bootloaders are up to date	None

2. Installation

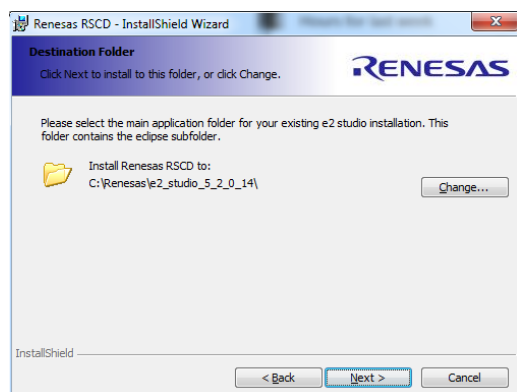
This section assumes that compatible versions of the Renesas e² studio IDE and the GNUARM-NONE toolchain are already installed. This software can be obtained from the following locations;

<https://www.renesas.com/e2studio>

<https://gcc-renesas.com>

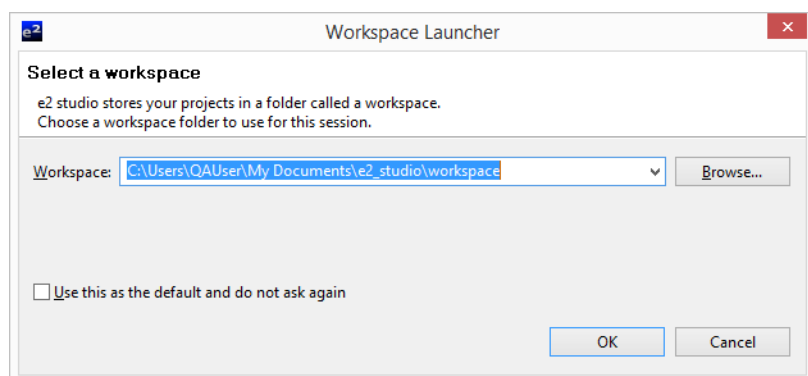
Create a new folder, for example 'C:\Renesas\Workspace\RSK\RSK+RZA1H\FreeRTOS'. Copy the application note zip package 'an_r01an3087eg0100_rza1h_rsk.zip' downloaded from the website to this folder and extract the contents to this location.

Within this application note package you will find the Renesas RSCD module installer RenesasRSCD.exe. This deploys the necessary RSCD modules into your current working copy of e² studio. Run the executable and ensure that the Renesas RSCD modules will be deployed to the correct location;



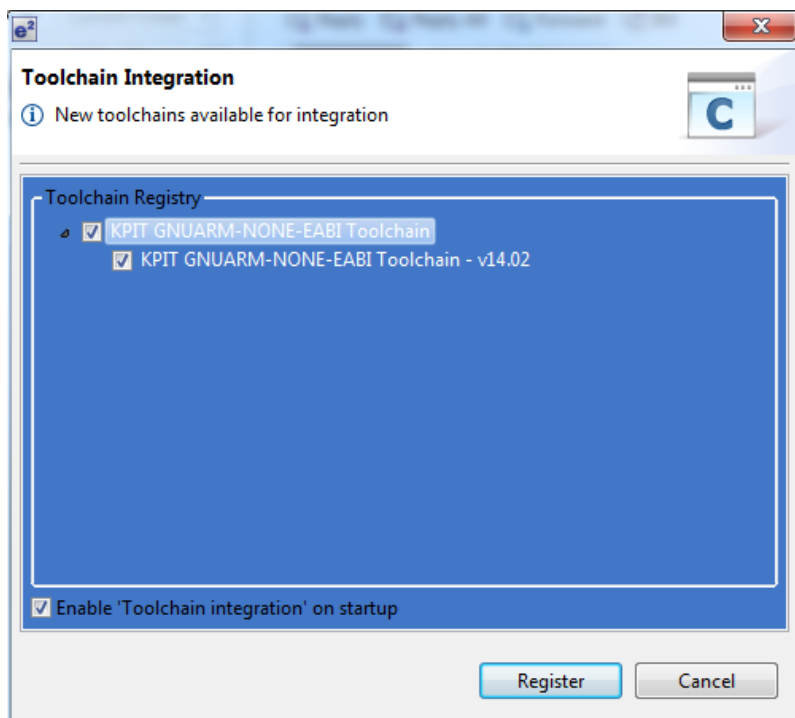
3. Creating the Project Workspace

Open e² studio by clicking the Windows Start button, select All Programs > Renesas Electronics e2 studio > Renesas e2 studio.



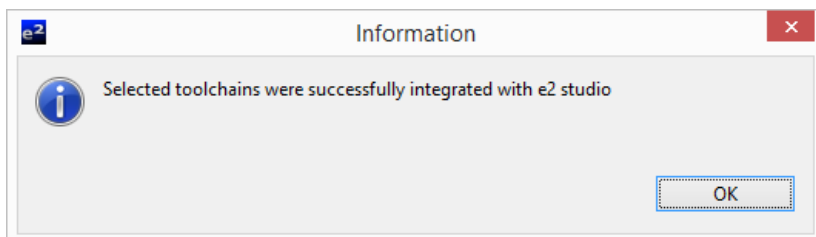
Select <OK>.

In the 'Toolchain Integration' dialog select the 'KPIT GNUARM-NONE-EABI Toolchain' and 'KPIT GNUARM-NONE-EABI Toolchain – v14.02' checkboxes.



Click <Register>.

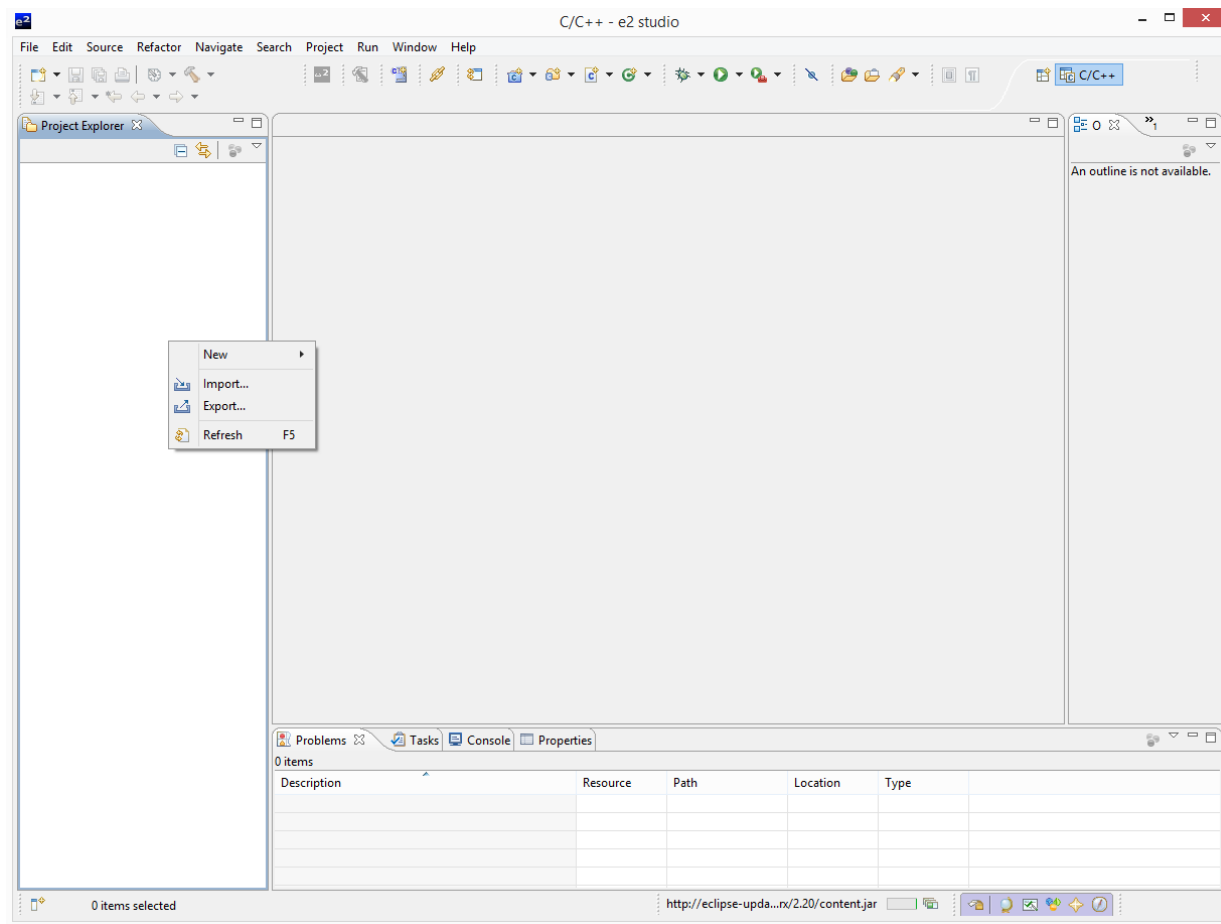
The 'Information' dialog below appears. Click <OK>.



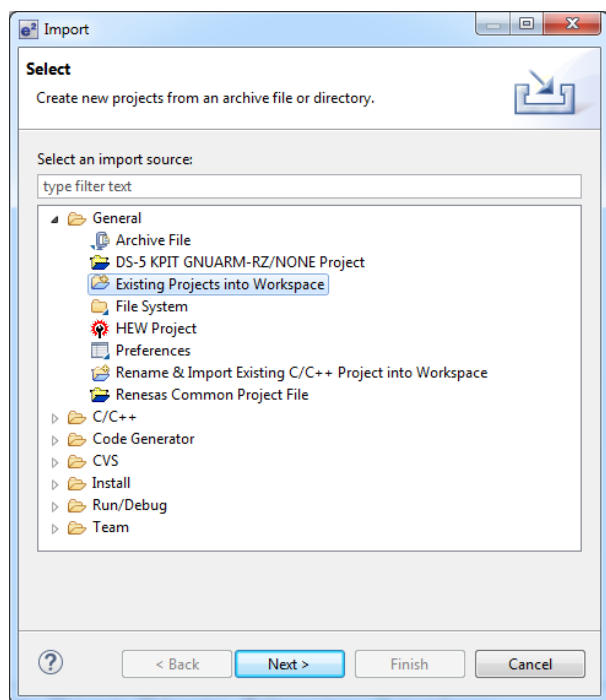
On the 'Welcome' dialog select the 'Go to the e2 studio workbench' icon as shown below.



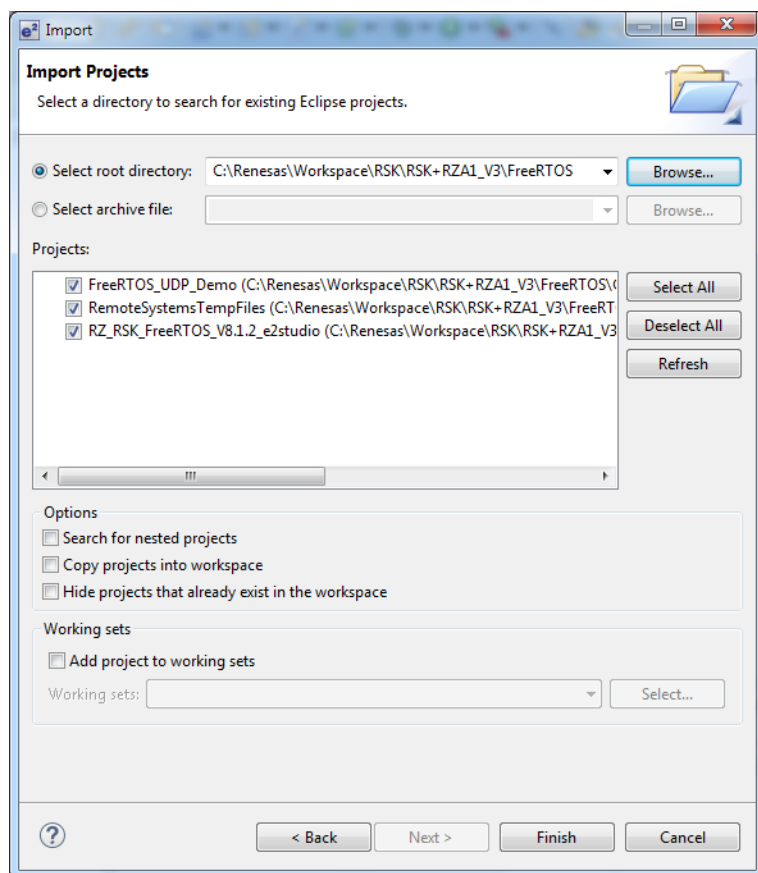
1. Right click in the project explorer window and click <Import...>



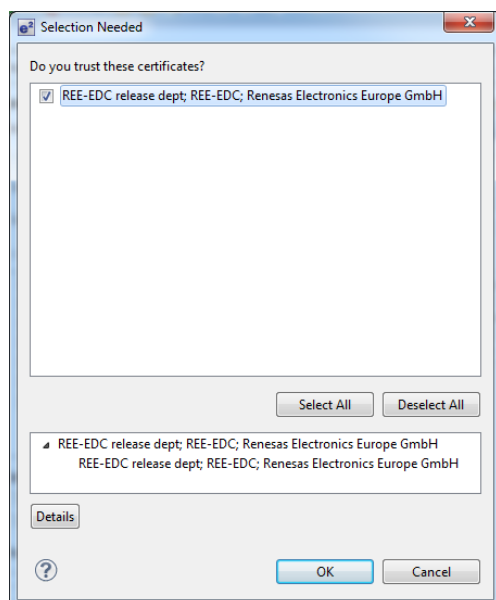
2. The 'Import - Select' dialog will now appear. Expand the “General” folder icon, and select “Existing Projects into Workspace”, then click ‘Next’.



3. The 'Import Projects' dialog will now appear. Select 'Select root directory', click the <Browse> button and locate the folder created earlier 'C:\Renesas\Workspace\RSK\RSK+RZA1H\FreeRTOS'.
4. Ensure the 'Copy projects into workspace' option is not ticked and then click <Finish> to import the project.



5. If prompted select the checkbox to trust certificates;



4. Integrating Additional Samples

For instructions on how to integrate additional samples into the 'RZ_RSK_FreeRTOS_V8.1.2_e2studio' project please refer to section 3 'Integrating additional samples' of the Quick Start Guide r20ut3490eg0100 provided in the \Manuals folder of this application note zip package.

5. 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.c". This source file will include the C function main().

6. Bootloader Update Instructions

These instructions are only applicable if you confirmed in section 1 that your board needs an update to the NOR and QSPI bootloaders.

To update the NOR and QSPI bootloaders you will need the loader projects provided in Application Note 'RZ/A1H Renesas Starter Kit+ Sample Code for e2 studio' r01an2511eg0200 or later version from the Renesas website.

The NOR and QSPI bootloaders can be updated by building the loader projects and programming the board.

Navigate to the project RZ_A1H_QSPI_LOADER, open 'description.txt' as described in section 4, and follow the instructions for configuring the board, building the project, and programming the QSPI.

Next, navigate to the project RZ_A1H_NOR_LOADER, open 'description.txt' as described in section 4, and follow the instructions for configuring the board, building the project, and programming the NOR.

Website and Support

Renesas Electronics Website

<http://www.renesas.com/>

Inquiries

<http://www.renesas.com/contact/>

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Revision History

Rev.	Date	Description	
		Page	Summary
1.0	14 Oct, 2016	All	First issue of Application Note.

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit 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.

5. Differences between Products

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 Microprocessing unit or Microcontroller unit products 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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