User's Manual

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RL78/L12 Group

Renesas Starter Kit Tutorial Manual For CubeSuite+

RENESAS MCU
RL78 Family / L1X Series

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Disclaimer

By using this Renesas Starter Kit (RSK), the user accepts the following terms:

The RSK is not guaranteed to be error free, and the entire risk as to the results and performance of the RSK is assumed by the User. The RSK is provided by Renesas on an “as is” basis without warranty of any kind whether express or implied, including but not limited to the implied warranties of satisfactory quality, fitness for a particular purpose, title and non-infringement of intellectual property rights with regard to the RSK. Renesas expressly disclaims all such warranties. Renesas or its affiliates shall in no event be liable for any loss of profit, loss of data, loss of contract, loss of business, damage to reputation or goodwill, any economic loss, any reprogramming or recall costs (whether the foregoing losses are direct or indirect) nor shall Renesas or its affiliates be liable for any other direct or indirect special, incidental or consequential damages arising out of or in relation to the use of this RSK, even if Renesas or its affiliates have been advised of the possibility of such damages.

Precautions

The following precautions should be observed when operating any RSK product:

This Renesas Starter Kit is only intended for use in a laboratory environment under ambient temperature and humidity conditions. A safe separation distance should be used between this and any sensitive equipment. Its use outside the laboratory, classroom, study area or similar such area invalidates conformity with the protection requirements of the Electromagnetic Compatibility Directive and could lead to prosecution.

The product generates, uses, and can radiate radio frequency energy and may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment causes harmful interference to radio or television reception, which can be determined by turning the equipment off or on, you are encouraged to try to correct the interference by one or more of the following measures;

- ensure attached cables do not lie across the equipment
- reorient the receiving antenna
- increase the distance between the equipment and the receiver
- connect the equipment into an outlet on a circuit different from that which the receiver is connected
- power down the equipment when not in use
- consult the dealer or an experienced radio/TV technician for help NOTE: It is recommended that wherever possible shielded interface cables are used.

The product is potentially susceptible to certain EMC phenomena. To mitigate against them it is recommended that the following measures be undertaken;

- The user is advised that mobile phones should not be used within 10m of the product when in use.
- The user is advised to take ESD precautions when handling the equipment.

The Renesas Starter Kit does not represent an ideal reference design for an end product and does not fulfil the regulatory standards for an end product.

How to Use This Manual

1. Purpose and Target Readers

This manual is designed to provide the user with an understanding of how to use the CubeSuite+ IDE to develop and debug software for the RSK platform. It is intended for users designing sample code on the RSK platform, using the many different incorporated peripheral devices.

The manual comprises of step-by-step instructions to load and debug a project in CubeSuite+, but does not intend to be a complete guide to software development on the RSK platform. Further details regarding operating the RL78/L12 microcontroller may be found in the Hardware Manual and within the provided sample code.

Particular attention should be paid to the precautionary notes when using the manual. These notes occur within the body of the text, at the end of each section, and in the Usage Notes section.

The revision history summarizes the locations of revisions and additions. It does not list all revisions. Refer to the text of the manual for details.

The following documents apply to the RL78/L12 Group. Make sure to refer to the latest versions of these documents. The newest versions of the documents listed may be obtained from the Renesas Electronics Web site.

Document Type	Description	Document Title	Document No.
User's Manual	Describes the technical details of the RSK hardware.	RSKRL78L12 User's Manual	R20UT0922EG
Tutorial	Provides a guide to setting up RSK environment, running sample code and debugging programs.	RSKRL78L12 Tutorial Manual	R20UT0923EG
Quick Start Guide	Provides simple instructions to setup the RSK and run the first sample, on a single A4 sheet.	RSKRL78L12 Quick Start Guide	R20UT0924EG
Schematics	Full detail circuit schematics of the RSK.	RSKRL78L12 Schematics	R20UT0921EG
Hardware Manual	Provides technical details of the RL78/L12 microcontroller.	RL78/L12 Group Hardware Manual	R01UH0330EJ

2. List of Abbreviations and Acronyms

Abbreviation	Full Form
ADC	Analog-to-Digital Converter
bps	bits per second
CPU	Central Processing Unit
CRC	Cyclic Redundancy Check
DTC	Data Transfer Controller
E1	On-chip Debugger
ELC	Event Link Controller
EMC	Electromagnetic Compatibility
ESD	Electrostatic Discharge
IIC	Philips™ Inter-Integrated Circuit Connection Bus
IRQ	Interrupt Request
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCU	Micro-controller Unit
PWM	Pulse Width Modulation
RSK	Renesas Starter Kit
SAU	Serial Array Unit
SFR	Special Function Register
UART	Universal Asynchronous Receiver/Transmitter
USB	Universal Serial Bus

Table of Contents

1. Overview

1.1 Purpose

This RSK is an evaluation tool for Renesas microcontrollers. This manual describes how to get the RSK tutorial started, and basic debugging operations.

1.2 Features

This RSK provides an evaluation of the following features:

- Renesas microcontroller programming
- User code debugging
- User circuitry such as switches, LEDs and a potentiometer
- Sample application
- Sample peripheral device initialisation code

The RSK board contains all the circuitry required for microcontroller operation.

2. Introduction

This manual is designed to answer, in tutorial form, the most common questions asked about using a Renesas Starter Kit (RSK). The tutorials help explain the following:

- How do I compile, link, download and run a simple program on the RSK?
- How do I build an embedded application?
- How do I use Renesas' tools?

The project generator will create a tutorial project with three selectable build configurations:

- 'DefaultBuild' is a project with debug support and optimisation level set to two.
- 'Debug' is a project built with the debugger support included. Optimisation is set to zero.
- 'Release' is a project with optimised compile options, producing code suitable for release in a product.

Files referred to in this manual are installed using the project generator as you work through the tutorials. The tutorial examples in this manual assume that installation procedures described in the RSK Quick Start Guide have been completed. Please refer to the Quick Start Guide for details of preparing the configuration.

These tutorials are designed to show you how to use the RSK and are not intended as a comprehensive introduction to the CubeSuite+ debugger, compiler toolchains or the E1 emulator. Please refer to the relevant user manuals for more in-depth information.

3. Tutorial Project Workspace

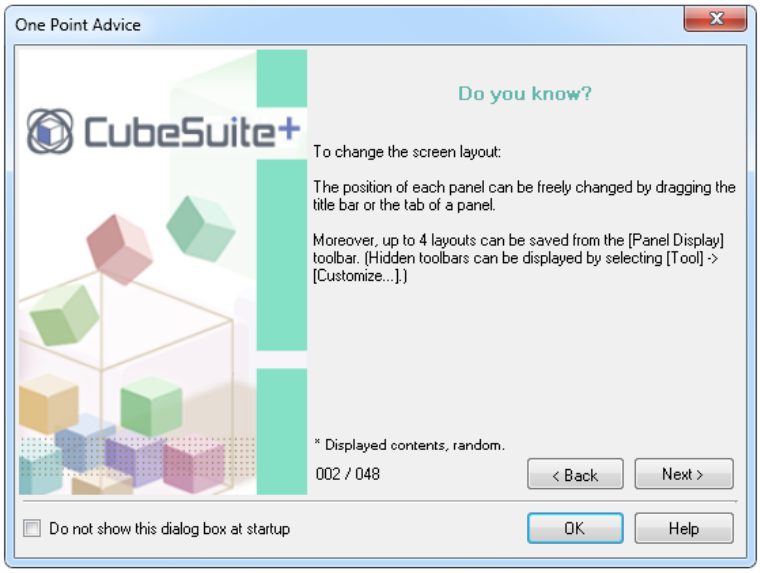
3.1 Introduction

CubeSuite+ is an integrated development tool that allows the user to write, compile, program and debug a software project on the RX, 78K, RL and V850 family of Renesas microcontrollers. CubeSuite+ will have been installed during the installation of the software support for the Renesas Starter Kit product. This manual will describe the stages required to create and debug the supplied tutorial code.

3.2 Starting CubeSuite+ and Connecting the E1 Debugger

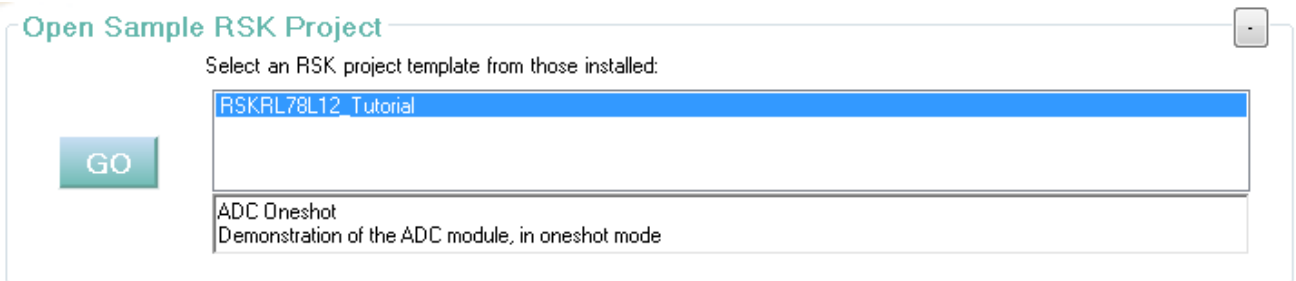
To use the program, start CubeSuite+ from the Windows™ Start Menu.

The first time CubeSuite+ is started, the One Point Advice dialog box will be shown:

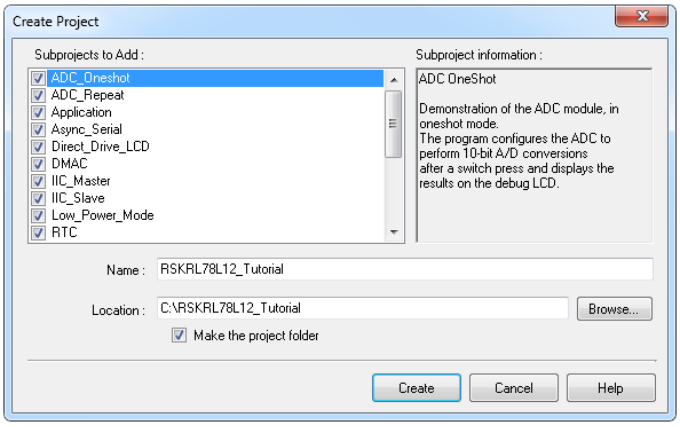


The One Point Advice dialog box provides some useful tips when using CubeSuite+. Press ‘OK’ to skip the advice and close the One Point Advice dialog. The user will then be presented with the Start panel.

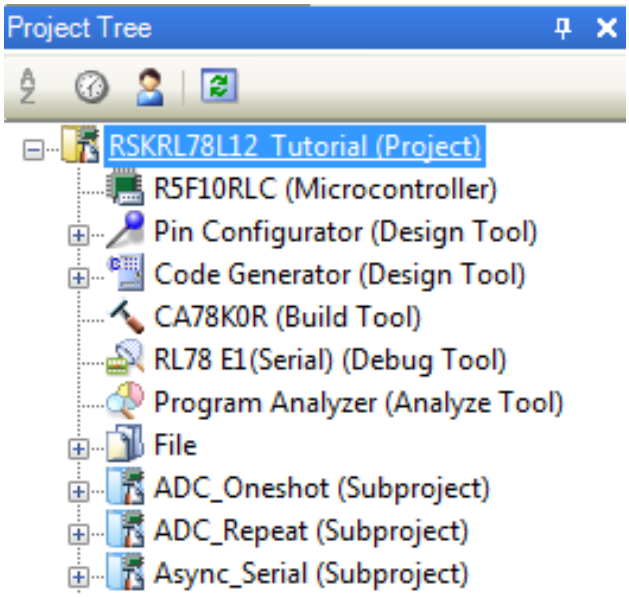
Under the ‘Open Sample RSK Project’, open a new Tutorial project by selecting the RSKRL78L12_Tutorial project template and click on ‘Go’ as shown below. This will save a copy of the RSKRL78L12_Tutorial project.



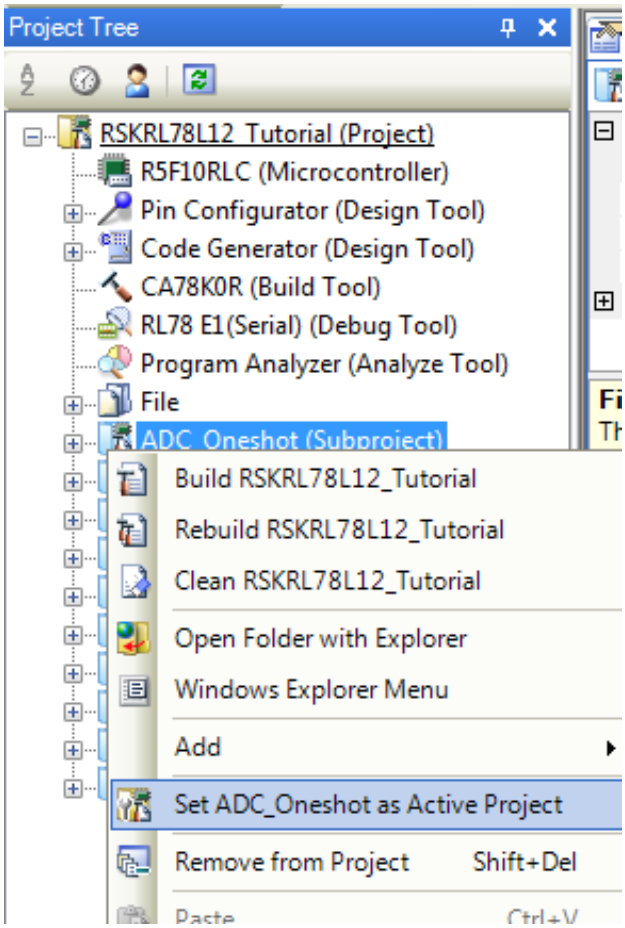
- CubeSuite+ will present a ‘Create Project’ dialog box.
- Select all sub-projects by clicking on each checkbox and observe the information displayed under the ‘Subproject information’ heading as you select each project.
- Specify a name and location for the new project and click on ‘Create’
- A dialog box will appear if the location specified does not exist; asking to create the folder specified. Click ‘OK’.



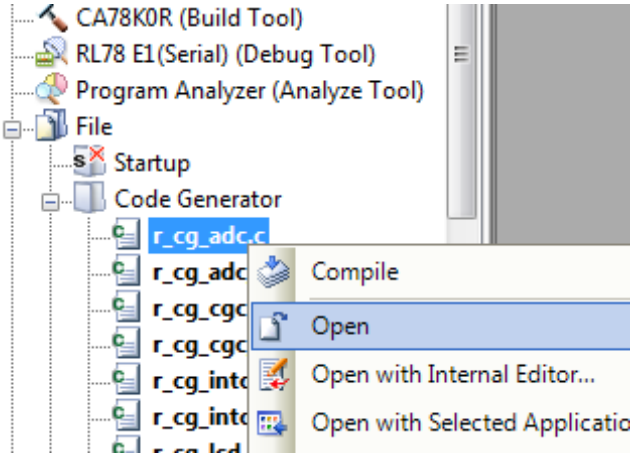
- CubeSuite+ will create and open the project showing the Project Tree as seen in the screenshot opposite.
- RSKRL78L12_Tutorial (Project) is the master project and includes the tools to modify, build and debug the code.
- The File folder seen in the screenshot belongs to the master project, RSKRL78L12_Tutorial.
- This folder contains and lists all project source and header files including text files arranged in separate folder structures.
- Folders containing the subprojects, indicated by “(Subproject)”, are listed below the File folder.
- Each subproject folder, when expanded, reveals an identical tools and folder structure to that of the master project, RSKRL78L12_Tutorial.
- By default the RSKRL78L12_Tutorial project is set as the active project, indicated by the line under the project name.



- To change the active project, right-click on the project/subproject name and select “Set x as Active Project” (x represents the project name).



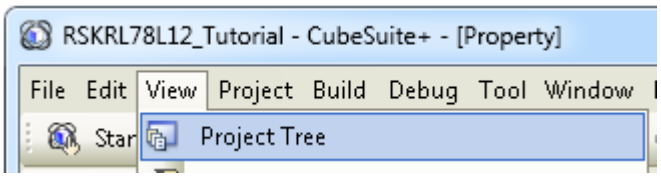
- The File folder contains four subfolders. This structure is common to all projects.
- Some of the source files were generated by Code Generator, which are grouped under the Code Generator folder which itself is listed under the File folder in the Project Tree. These files are prefixed with ‘r_’ to indicate that they were generated by Code Generator. All other user-generated or user-included source files are listed separately from files output by the Code Generator. For an introduction to Code Generator, see §7.
- To open a file for viewing, right-click on the file and select ‘Open’. Alternatively, double-click on the file.



3.3 Configuring the Debug Tool (E1)

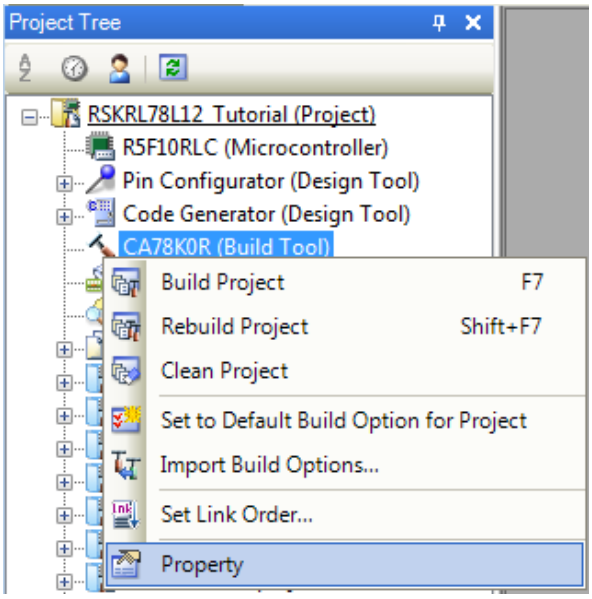
Note: The Tutorial sample project's settings are pre-configured. This section is intended to familiarise the user with the debug tool settings for when they create their own project.

- The Project Tree will be displayed on the left-hand pane of CubeSuite+.
- This can also be invoked from the menu bar [View > Project Tree].

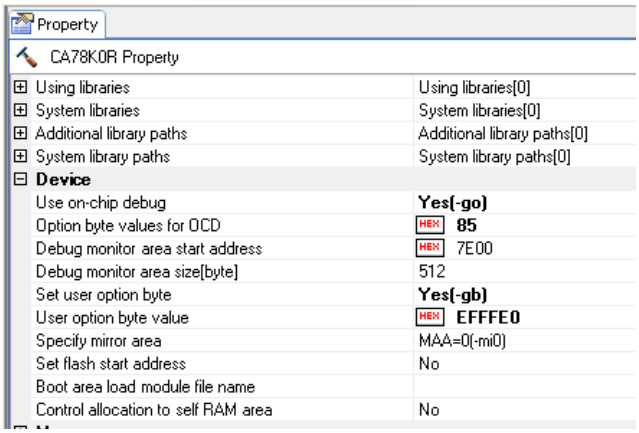


This list contains a number of tools used in configuring the IDE for programming and debugging of the device, as well as listing source code files. Follow the following instructions to verify the pre-configured settings:

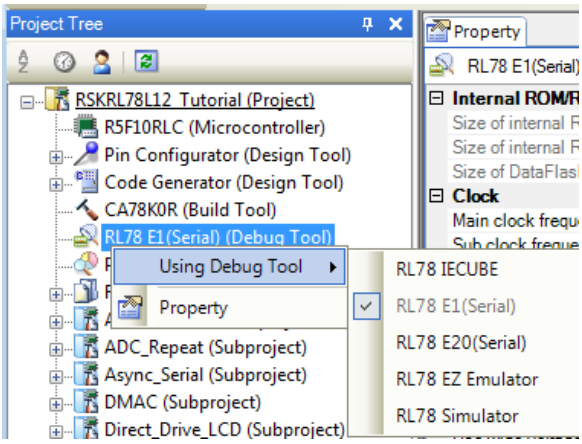
- Right click on CA78K0R (Build Tool).
- Click on Property.



- Click on the Link Options tab to open the sheet.
- Expand the Device entry to reveal the sub-entry options.
- Verify that the Debug monitor area start address is as shown on the opposite screen-shot.

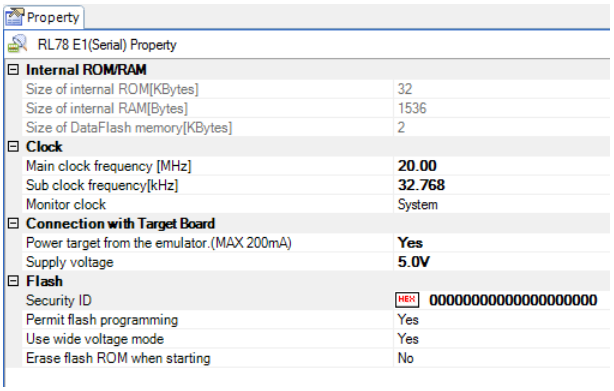


- The opposite screen-shot indicates that the selected Debug Tool is E1.



- Right click on RL78 E1(Serial) (DebugTool).
- Click on Property.
- View the Connect Settings.
- Verify that the settings match the opposite screen-shot.

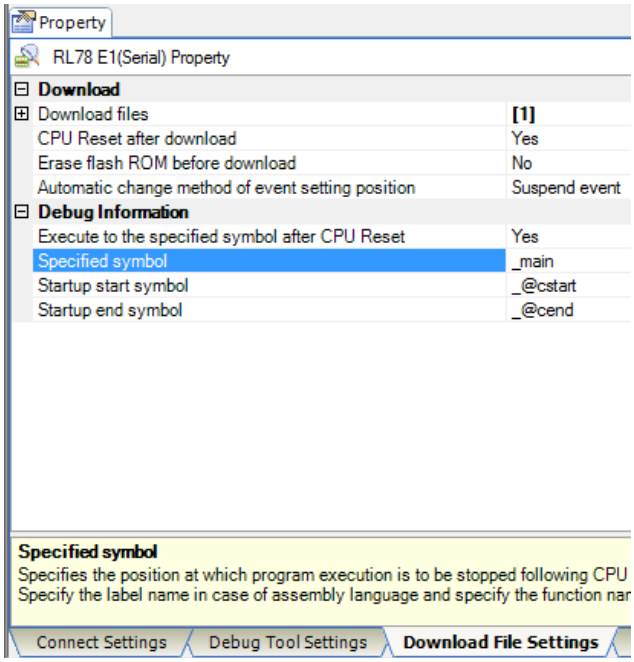
Note: To supply external power to the target board, set the 'Power target from emulator. (MAX 200mA)' entry to 'No'.



The project is configured to halt code execution on the first instruction of the main function after programming the micro-controller. To specify another function as the entry point:

- View the Download File Settings of the RL78 E1's property.
- Change the 'specified symbol' to another available function.
- Ensure to prefix the function name with an underscore ("_").

Note: Do not specify an interrupt handler as the entry point.

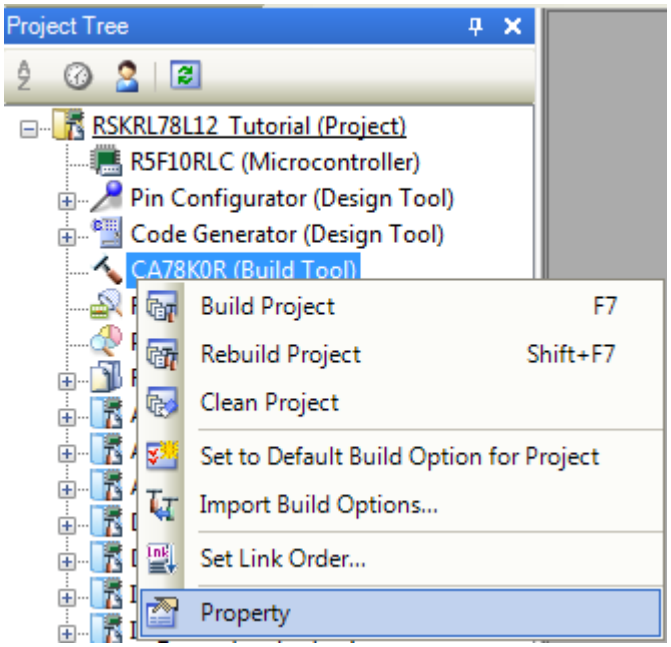


3.4 Build Configuration

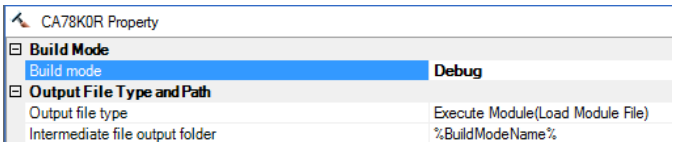
The build configurations are selected from the build tool's Property panel. The options available are DefaultBuild, Debug and Release. DefaultBuild and Debug are configured for use with the debugger. Release is configured for the final ROM programmable code.

A common difference between the two builds is the optimisation setting and the addition of debug information. With optimisation turned on, the debugger may seem to execute code in an unexpected order. To assist in debugging it is often helpful to turn optimisation off on the code being debugged.

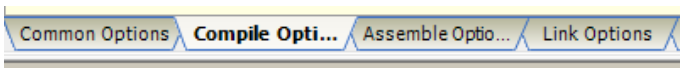
- Right-click on CA78K0R (Build Tool) from the Project Tree.
- Select 'Property'.



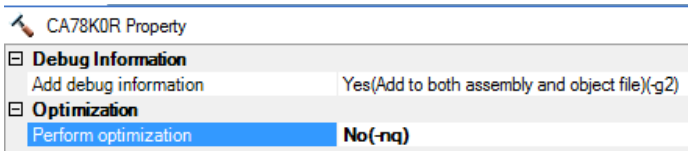
- The Common Options sheet will open by default.
- Verify that the Build Mode is set to Debug.



- Click on the Compile Options sheet to view compiler options.



- Ensure the 'Add debug information' entry is set to 'Yes (Add to both assembly and object file)(-g2)'.
- Ensure the 'Optimization' entry is set to 'No'.



4. Building the Tutorial Program

The tutorial project build settings have been pre-configured in the toolchain options. To view the toolchain options double-click on CA78K0R (Build Tool) from the Project Tree and select the available tabs. It is important when changing settings to be aware of the current configuration before modifying the settings.

- Review the options on each of the tabs to be aware of the options available. For the purposes of the tutorial, leave all options at default.
- When complete, the Property panel can be closed by clicking [x] on the right-hand corner of the Property window.

4.1 Building the Code

There is a choice of three shortcuts available for building the project:

- Selecting the ‘Build Project’ toolbar button will build all projects listed in the project tree.

- Pressing [F7]. This is equivalent to pressing the ‘Build Project’ toolbar button.

- Selecting the ‘Rebuild Project’ toolbar button will rebuild all project files.

- Selecting the ‘Build & Download’ toolbar button will only build the active project and download the code to the target device after a successful build.

- Pressing [F6]. This is equivalent to pressing the ‘Build & Download’ toolbar button.

Build the project now by pressing [F7] or pressing one of the build icons as shown above. During the build each stage will be reported in the Output Window. The build will complete with an indication of any errors and warnings encountered during the build.

4.2 Connecting the Debugger

For this tutorial it is not necessary to provide an external power supply to the board. The power will be obtained from the USB port. Please be aware that if you have too many devices connected to your USB port it may be shut down by Windows. If this happens remove some devices and try again. Alternatively provide an external power source taking care to ensure the correct polarity and voltage.

Other sample code supplied with this RSK will require a variable power supply; in which case an external 0-5V variable power supply should be used. Refer to the RSKRL78L12 User Manual for further details.

The Quick Start Guide provided with the Renesas Starter Kit board gives detailed instructions on how to connect the E1 to the host computer. The following assumes that the steps in the Quick Start Guide have been followed and the E1 drivers have been installed.

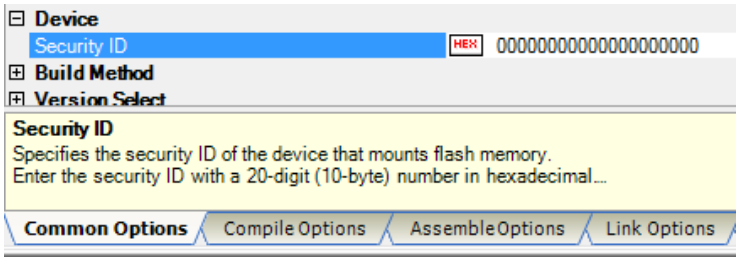
- Fit the LCD panel to the board, via the header marked 'JA4'. Ensure all the pins of the connector are correctly inserted in the socket.
- Connect the E1 Debugger to a free USB port on your computer.
- Connect the E1 Debugger to the target hardware ensuring that it is plugged into the connector marked 'E1'.
- If supplying external power to the board please refer to Section 3.3 to turn off the option of supplying power from the E1 before turning on the external power supply.

4.3 Connecting to the Target with the E1 Debugger

This section will take you through the process of connecting to the device, programming the Flash and executing the code.

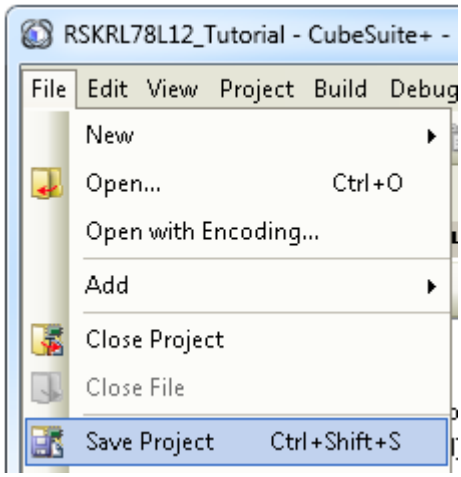
- Double click on CA78K0R (Build Tool) to open the Property view.
- In the Common Options tab; found under the Property view, verify that the Security ID is set to 00000000000000000000 under the 'Device' entry.

Note: The project has been configured not to use the Security ID feature.



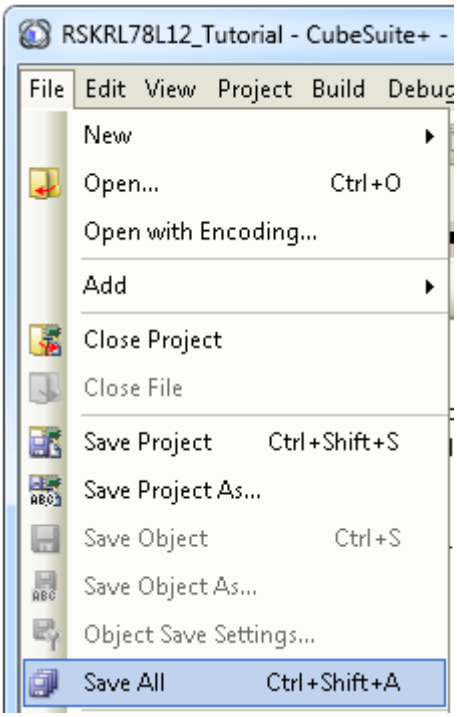
If you have changed any project settings this is a good time to save the project.

- Select 'File' | 'Save Project'.



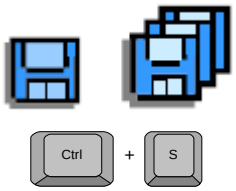
If you make any changes to files in CubeSuite+ and want to preserve these change, you can save them by:

- Select ‘File’ | ‘Save All’.



You can also save files by clicking the ‘Save’ or ‘Save All’ buttons from the CubeSuite+ toolbar.

In addition files can be saved using the keyboard shortcut [Ctrl + S]:



5. Downloading and Running the Tutorial

5.1 Downloading the Program Code

Now that the code has been built in CubeSuite+ it needs to be downloaded to the RSK.

- Click on the program download button. Alternatively, select Debug from the Menu bar and click on Download.

- On completion of program download, the debugger and code are ready to be executed. The program counter indicator will point to first line of code inside the main function; this is the program's entry point.

```
/***********************************************************************
* Function Name: main
* Description  : This function implements main function.
* Arguments    : None
* Return Value : None
***********************************************************************/
void main(void)
{
    R_MAIN_UserInit();
    /* Start user code. Do not edit comment generated here */

    /* Enable and configure LCD display. Disable the switch's ex
       function multiplexed with the SEG32 and SEG33 pins and SE
    Init_Display_Panel(ENABLE_SW2_SW3, DISABLE_UART);

    /* Display the device family name on LCD.
       Casting to ensure use of correct data type. */
    Display_Panel_String(PANEL_LCD_LINE1, " RL78");

    /* Flash all available LCD segments */
    Flash_LCD();

    /* Begins the ADC-varying flash sequence */
    Timer_ADC();
```

5.2 Running the Tutorial

Once the program has been downloaded onto the RSK device, the program can be executed. Click the 'Go' button to begin the program from the current program counter position. It is recommended that you run through the program once first, and then continue to the review section.

6. Reviewing the Tutorial Program

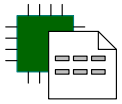
This section will look at each section of the tutorial code and basic debugging functionality in CubeSuite+.

6.1 Program Initialisation

Before the main program can run, the microcontroller must be configured. Due to the debugger configuration used for the Tutorial project and the rest of the sample projects, the user will not be able to step through the hardware initialisation code. Please refer to Section 3.3 to change the entry point after programming the microcontroller. Specify '_R_Systeminit' as the function name if viewing of hardware initialisation is desired. The initialisation code is executed every time the device is reset via the reset switch or from a power reboot. The user is advised not to use the 'step' feature of the debugger to exit the R_Systeminit function.

Ensuring the Tutorial program has been downloaded onto the RL78/L12; press the 'CPU Reset' button on the Debug Toolbar.

- From the Menu bar select View > Disassemble > Disassemble1. Alternatively, use the Display Disassemble button to open and view the 'source and disassembly'.
- To make the Display Disassemble button available on the toolbar, right-click on the toolbar and select 'View Panels'.



Revert back to the source by clicking on the file containing the function pointed to by the program counter indicator. Alternatively, right click in the Disassemble1 window and click "Jump to Source"

```
83:       void main(void)
84:       {
85:           R_MAIN_UserInit();
          _main:
  013ba       fce41300    CALL            !!_R_MAIN_UserInit
86:       /* Start user code. Do not edit comment generated here
87:
88:       /* Enable and configure LCD display. Disable the switch
89:          function multiplexed with the SEG32 and SEG33 pins a
90:       Init_Display_Panel(ENABLE_SW2_SW3, DISABLE_UART);
  013be       f6          CLRW            AX
  013bf       c1          PUSH            AX
  013c0       fcba0200    CALL            !!_Init_Display_Panel
  013c4       c0          POP             AX
91:
92:       /* Display the device family name on LCD.
93:          Casting to ensure use of correct data type. */
94:       Display_Panel_String(PANEL_LCD_LINE1, " RL78");
  013c5       30c220      MOVW            AX,#20C2H
  013c8       c1          PUSH            AX
  013c9       303300      MOVW            AX,#33H
  013cc       fcc80f00    CALL            !!_Display_Panel_String
  013d0       c0          POP             AX
95:
96:       /* Flash all available LCD segments */
97:       Flash_LCD();
  013d1       fc0a1a00    CALL            !!_Flash_LCD
```

6.2 Main Functions

This section will look at the program code called from with the main() function, and how it works.

- Right click the 'Flash_LCD()' function call and select 'Go to Here' to execute the program up to this line. The 'Init_Display_Panel()' function call enables and configures the LCD panel, and 'Display_Panel_String()' will write "RL78" onto the bottom line.

```
void main(void)
{
    R_MAIN_UserInit();
    /* Start user code. Do not edit comment generated here */

    /* Enable and configure LCD display. Disable the switch's exte
       function multiplexed with the SEG32 and SEG33 pins and SEG2
    Init_Display_Panel(ENABLE_SW2_SW3, DISABLE_UART);

    /* Display the device family name on LCD.
       Casting to ensure use of correct data type. */
    Display_Panel_String(PANEL_LCD_LINE1, " RL78");

    /* Flash all available LCD segments */
    Flash_LCD();

    /* Begins the ADC-varying flash sequence */
    Timer_ADC();
```

- Set a software breakpoint on the 'Timer_ADC()' function call by clicking on the On-Chip Breakpoint column to the left of the number column.
- Click the 'Step In' button to step into the 'Flash_LCD()' function. Alternatively, press [F11].


```
    /* Flash all available LCD segments */
    Flash_LCD();

    /* Begins the ADC-varying flash sequence */
    Timer_ADC();

    /* Demonstration of initialised variables.*/
    statics_test();
```

- The program counter should now move into the Flash_LCD function definition. This function activates a timer to periodically poll the user switches and flashes all the LCD segments 200 times or until a user switch has been pressed.
- Press the 'Go' button to resume program execution.
- On exiting the loop, the function disables the periodic timer and returns to the main function.

```
void Flash_LCD (void)
{
    /* Declare loop count variables */
    uint32_t led_delay  = 0u;
    uint8_t flash_count = 0u;

    /* Turn off all segments */
    LCD_DISPLAY_OFF();

    /* Enable SW1 interrupts */
    R_INTC0_Start();

    /* Start timer used to poll swithces SW2 and SW3
       as they are not connected to interrupt-enabled pins *
    R_TAU0_Channel7_Start();

    /* Flash the LEDs for 200 times or until a user switch i
    while((FALSE == g_switch_flag) && (flash_count++ < FLASH
    {
        /* LED flashing Delay */
        for (led_delay = 0; led_delay < LED_FLASH_DELAY; led
        {
            /* Delay */
        }

        /* Toggles the LCD segments */
        Toggle_LCD();
    }
```

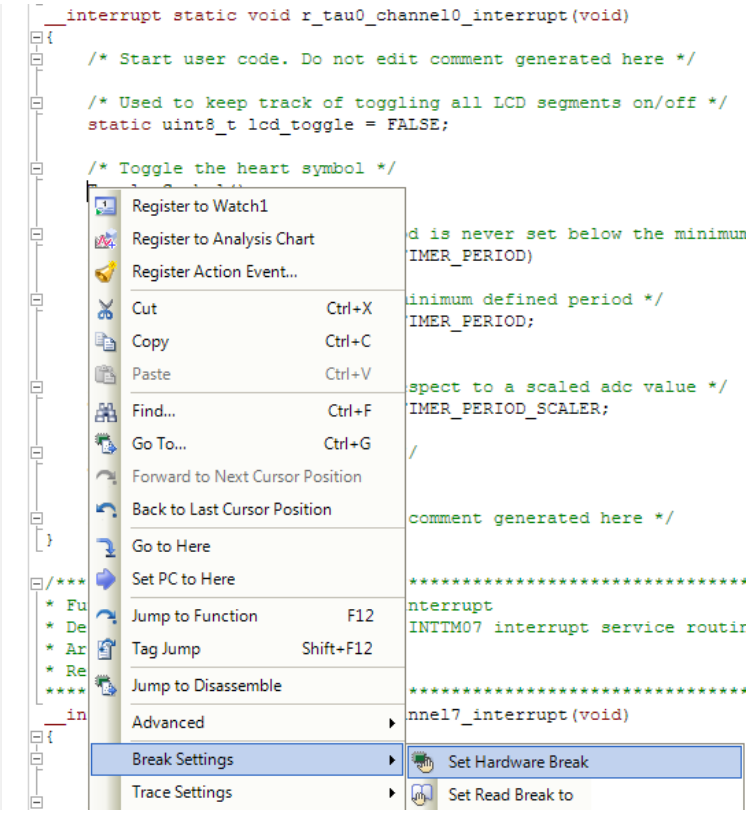
- The program counter should come to a halt at the Timer_ADC function.
- Step over the function by clicking the 'Step Over' button. Alternatively, press F10.


```
/* Flash all available LCD segments */
Flash_LCD();

/* Begins the ADC-varying flash sequence
Timer_ADC();

/* Demonstration of initialised variables
statics_test();
```

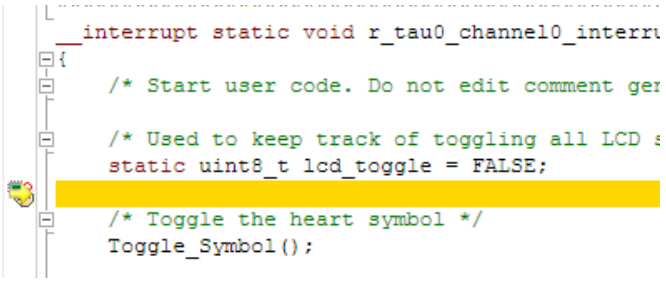
The Timer_ADC function starts a continuous A/D conversion and a periodic timer whose period is up-dated with the ADC result.

This timer is used to flash the heart symbol on the LCD panel at a variable rate.

- Open the 'r_timer_user.c' file.
- Set a hardware breakpoint on the first line of code inside the 'r_tau0_channel0_interrupt()' interrupt handler by right-clicking on the first instruction line > Break Settings > Set Hardware Break.
- Continue to execute the program by pressing the 'Go' button.



- The program will halt at the hardware breakpoint due to the timer's period elapsing.
- Remove the hardware breakpoint by clicking on the icon once.



- Press [F5] to resume program execution.
- Observe the string on the bottom line of the LCD panel change one character at a time from ‘RL78’ to ‘L12’ as the ‘statics_test’ function is executed.
- After all characters have been changed, the LCD panel’s second line will return to displaying ‘RL78’
- The LCD panel will also display a real-time clock, counting up from 00:00:00. This is operated by an interrupt in the file ‘r_cg_rtc_user.c’, the analysis of which is outside the scope of this manual.

```
/***********************************************************************
* Function Name : statics_test
* Description   : Displays an initialised string, then modifies it, a cha
*                 Finally RL78 is displayed.
* Arguments     : None
* Return value  : None
***********************************************************************/
static void statics_test (void)
{
    /* Declare loop count variable */
    uint8_t count = 0U;

    /* Turn off all LCD segments */
    LCD_Display_Off();

    /* Display the device family name on LCD.
       Casting to ensure use of correct data type. */
    Display_Panel_String (PANEL_LCD_LINE1, " RL78");

    /* Delay */
    Display_Panel_Delay (DELAY_REPLACE);

    /* Begin for loop which writes one letter of g_const_str to the LCD e
       The nested while loops generate the delay between each letter char
    for (count = 0U; count < STRING_SIZE; count++)
    {
        /* Copy the bytes from gConstStr to gReplaceStr one byte at a tim
        g_replace_str[count] = g_const_str[count];

        /* Display the updated string on the LCD.
           Casting to ensure use of correct data type. */
        Display_Panel_String (PANEL_LCD_LINE1, (const char *)g_replace_st

        /* Delay */
        Display_Panel_Delay (DELAY_REPLACE);
    }

    /* RL78 family name is displayed on the LCD */
    Display_Panel_String (PANEL_LCD_LINE1, " RL78");
}
/***********************************************************************
End of function statics_test
***********************************************************************/
```

- Press the ‘Stop’ button to halt program execution.
- This is the extent of the tutorial code.

For further details regarding hardware configuration, please refer to the RL78 Series Software Manual and the RL78/L12 Hardware Manual.

The E1 emulator features advanced logic-based event point trigger system, and full instruction on its use is outside the scope of this tutorial. For further details, please refer to the E1 Emulator User’s Manual

7. Introduction to Code Generator

7.1 What is Code Generator

Code Generator is a design tool which enables you to output the source code (device driver programs, C source files and header files) necessary to control the peripheral hardware functions provided by the microcontroller device (clock generator, port functions, etc.) by configuring various information using the GUI. This tool is integrated into CubeSuite+.

7.2 Features

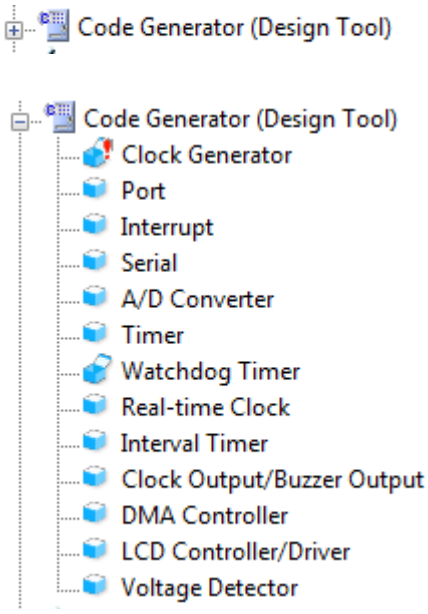
The Code Generator has the following features:

- Reporting
  You can output configured information using the Code Generator as files in various formats for use as design documents.
- Renaming
  The user can change default names assigned to the files output by Code Generator and the API functions contained in the source code.
- Code generation
  Code Generator can output device driver programs in accordance with the information configured using the GUI, along with a build environment such as sample programs containing main functions and link directive files.
- Project/workspace file generation.

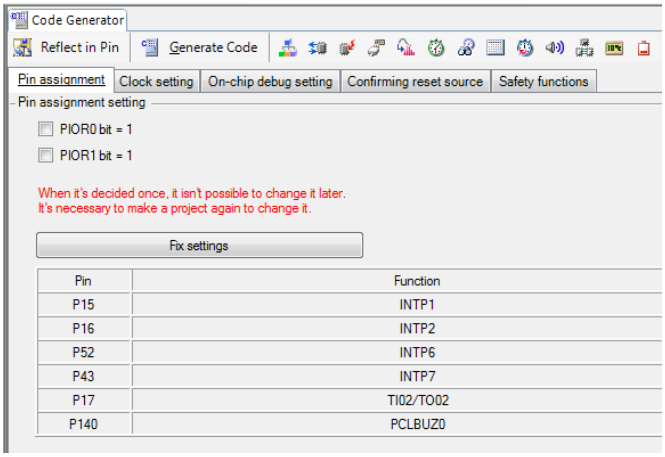
7.3 Code Generation

The following steps serve as a short presentation of how to generate source code using the Code Generator design tool for a new project/subproject. It assumes that a project already exists and is opened.
For more details on how to use Code Generator, refer to the document “CubeSuite+ V1.03.00 Integrated Development Environment User’s Manual: RL78 Design”.

- Double-click the Code Generator (Design Tool) from the Project Tree pane to reveal the list of peripherals.
- The project tree shows all configurable peripherals of the selected device.
- The exclamation mark on the Clock Generator will disappear after the Pin Assignment configuration; shown in the screenshot following this one.
- The Watchdog Timer module is configured and enabled by default; indicated by the open box.
- Double-click on the Clock Generator peripheral.

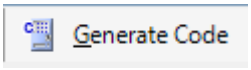


- Click on the ‘Fix settings’ button.
- The ‘Clock setting’ tab contains options for configuring the clocks.
- The ‘On-chip debug setting’ tab contains an option to enable/disable debugging and the use of a security ID. Ensure to set the ‘On-chip debug operation setting’ to ‘Used’ for debugging projects.



- The icons in the opposite screen-shot show the available peripherals that can be configured. Click each icon to open the settings view and configure the desired peripherals.

- Click on ‘Generate Code’ after configuring all desired peripherals, to generate the project source and header files.



- The generated files will automatically be created and placed in the project folder.

Note: If files of the same name already exist in the IDE project folder, it may be necessary to back-up the old files before overwriting them

Note: The Application sample project is an empty sample project with temporary files generated from Code Generator. Users are encouraged to generate the source files containing API functions based on their application development’s requirements and use them in the Application sample project.

8. Additional Information

Technical Support
For details on how to use CubeSuite+, refer to the manual available on the DVD or from the web site.

For information about the RL78/L12 series microcontrollers refer to the RL78/L12 Group Hardware Manual.

For information about the RL78 assembly language, refer to the RL78 Series Software Manual.

Technical Contact Details

***Please refer to the contact details listed in section 8 of the* "Quick Start Guide"**

General information on Renesas microcontrollers can be found on the Renesas website at:
http://www.renesas.com/

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