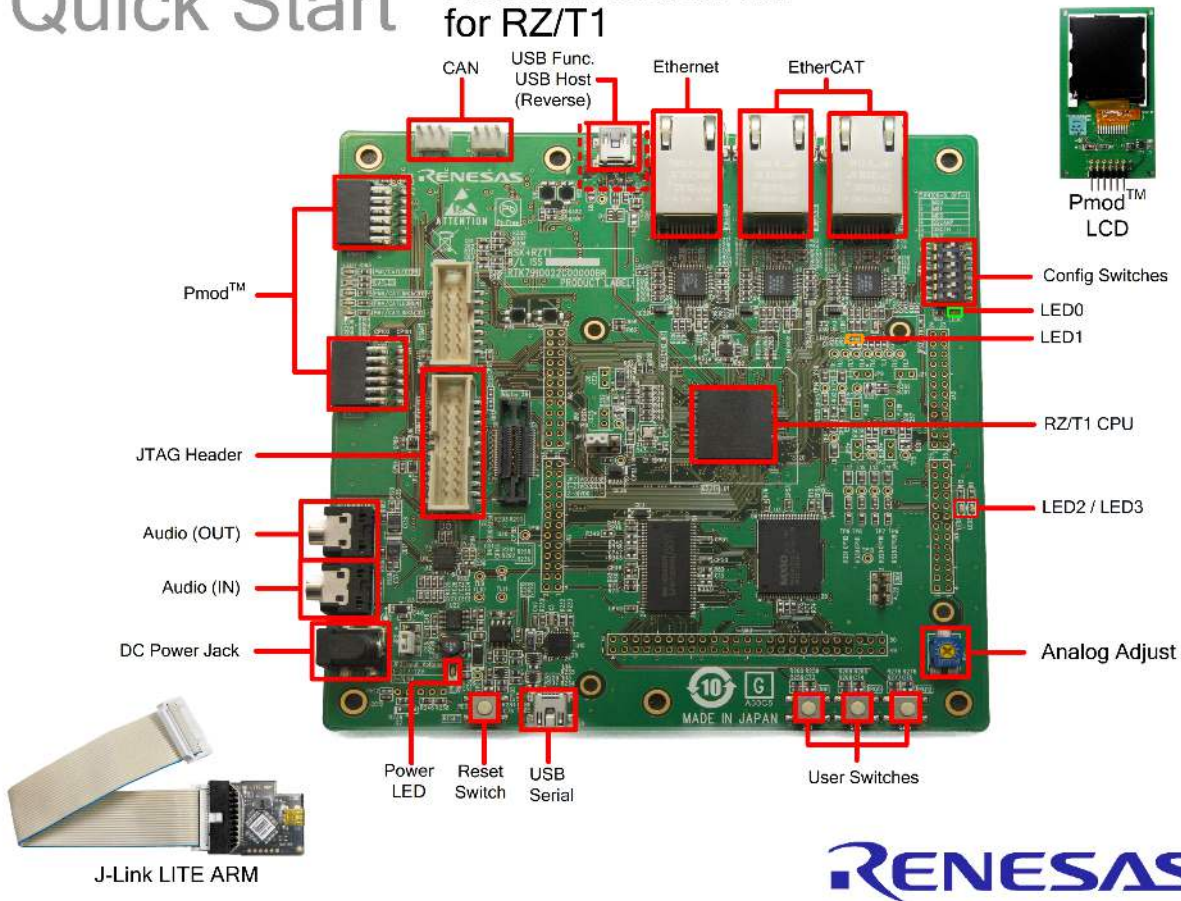# Quick Start
Renesas Starter Kit+ for RZ/T1

NOTE: This Quick Start Guide covers installation of the e² studio. An active internet connection is required for downloading the RSK+RZT1 installer.

1. Installation

Do not connect the J-Link LITE ARM debugger module or any hardware until the software support has been installed.

1. Software for this Renesas kit is available for download from;

    www.renesas.com/rskrzt1/install

2. After download the installer will run and display the Welcome dialog. Follow the on-screen instructions to install the RSK+ software. This process will take several minutes.

Note:

Windows™ 7/ 8.1 users may see "User Account Control" dialog box. If applicable, enter the administrator password and click 'Yes'.

The Windows™ driver signing dialog box may be displayed during installation. Please accept the driver to continue.

If prompted to update the J-Link firmware at any point of this guide, please select the option to update the firmware.

2. Connection

3. Connect the J-Link LITE ARM debugger module to the J10 connector marked 'ARM JTAG 20' on the silk screen ('JTAG Header' on the diagram) using the ribbon cable.

4. Connect the J-Link LITE ARM debugger module to a spare USB port of your PC. The green LED on the debugger will flash.

5. Please follow the steps below to install the drivers. Note that administrator privileges are required to install the drivers.

<div align="center">Windows™ 7 / 8.1</div>

- Windows™ 7: A "Device driver software installed successfully" pop-up will appear in the Windows™ toolbar and installation will complete.
- Windows™ 8.1: An icon will appear in the Windows™ toolbar and installation will complete.

6. The green LED on the J-Link LITE ARM debugger will illuminate.

7. Ensure that only SW4.6 is set to the OFF position, to run from QSPI memory.

8. Connect the Pmod™ LCD to J13 (PMOD1) connector.

9. Connect a USB cable between the USB Serial connector (J8) on the RSK+ and an available USB port on the host PC.

10. Use any serial terminal (e.g. HyperTerminal, Tera Term or PuTTY), select the appropriate COM port and set the baud-rate to 19200 bps, Data bits to 8, Stop bits to 1, Parity to None and Flow as None.

11. Ensure pins 2 and 3 of the JP2 header are shorted to configure the board for use with a 5V power supply.

12. Connect a centre-positive +5V power supply to the connector marked PWR and apply the power.

3. Importing Sample Code into e^2 studio

e^2 studio integrates various tools such as compiler, assembler, debugger and editor into a common graphical user interface.

13. Start e^2 studio from the start menu:

> Start > All Programs > Renesas Electronics e2 studio 4.0 > Renesas e2 studio

Windows™ 8.1:

> Apps > Renesas Electronics e2studio > e2 studio

Note: A firewall warning may be displayed for 'eclipse.exe'. Check the 'Private networks, such as my home or work network' box and click 'Allow access'.

14. In the 'Select a workspace' folder that appears, browse a suitable location and folder name to save your new workspace. Click 'OK'.

15. Toolchain registration dialog will appear. Select the available toolchains. Click 'Register'.

16. In the 'Code Generator Registration' dialog click 'OK'. A 'Code Generator COM component register' dialog will pop-up with the text "Please restart e2 studio to use Code Generator". Click 'OK'.

17. In the 'Restart e2 studio' dialog click 'OK'. e^2 studio will be restarted due to first-time registration of the Code Generator COM components.

18. In the e^2 studio welcome screen, click 'Go to the workbench', which is the last item under the e^2 studio Resources' heading.

19. Right-click in the Project Explorer window, and select 'Import'.

20. Under 'Import Source' select General > Existing Projects into Workspace, and click 'Next'.

21. Click the 'Browse' button, and locate the following root project directory: 'C:\Renesas\Workspace\RSK\RSK+RZT1'

22. Ensure the 'Copy projects into workspace' option is ticked and then click 'Finish'.

4. Programming and Debug

23. Left-click the 'Tutorial' project to select it, then click the arrow next to the build button (hammer icon), and select 'HardwareDebug' from the drop down menu.

24. e^2 studio will now build the project. Once this is complete, debugging can be started by clicking the arrow next to the debug button (bug icon), and selecting 'Debug Configurations…'.

25. Click the symbol next to the entry 'Renesas GDB Hardware Debugging' to expand the list. Select the configuration entry which matches the current project.

26. The debug configurations control page will contain settings for the device selected during project creation. There is no need to alter the preset configurations.

27. In the 'Debugger' tab, verify that 'Debug hardware' selected is 'J-Link ARM' and 'Target Device' is R7S910018.
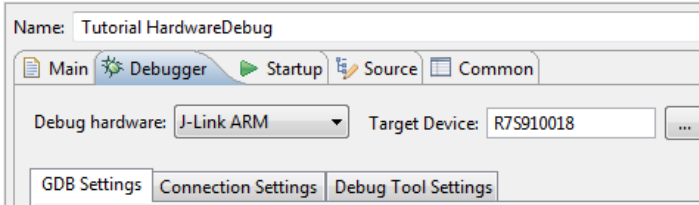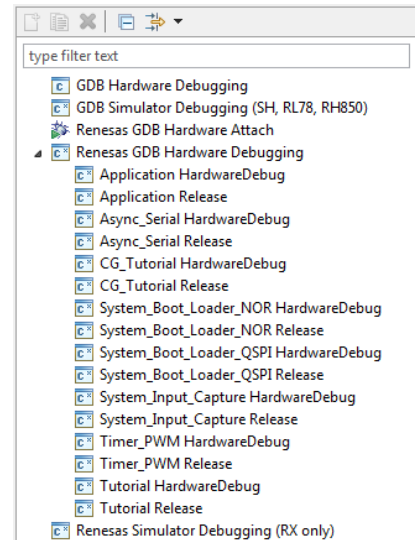
28. Click the 'Debugger' tab, then the 'Connection Settings' secondary tab. Review the 'Debug hardware' and 'Target Device' settings listed in the screenshot below.
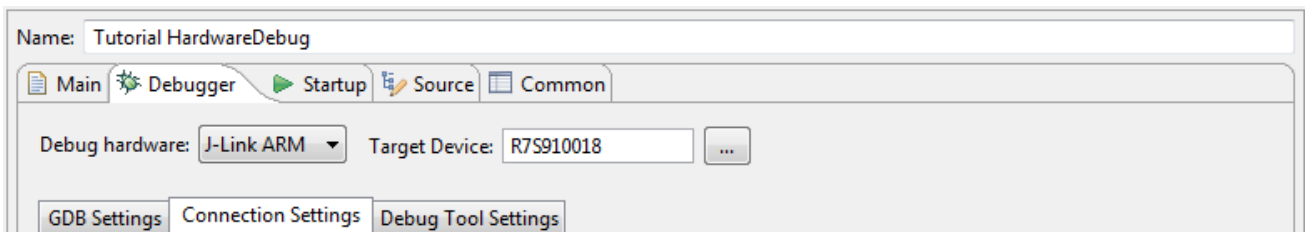

29. Click the 'Debug' button located at the bottom right corner to download the code to the target, and begin debugging.

30. A firewall warning may be displayed for 'e2-server-gdb.exe'. Select the check-box for 'Private networks, such as my home or work network', and click 'Allow access'.

31. A User Account Control dialog may be displayed. Enter the administrator password and click 'Yes'.

32. e² studio will ask you to change to the 'Debug Perspective', click 'Yes'.

33. Once the code has been downloaded, click the 'Resume' button to run the code up to the first line of the main function, R_Systeminit(); click the 'Resume' button to run the target through the code.

34. The serial terminal settings from Step 10 are also valid for this sample.

35. Refer to the serial terminal and LCD display. Enter character 'c' on the serial terminal or press switch SW3 to perform an A/D conversion. The result will be displayed on the Pmod LCD.

36. Rotate the analog adjust control (RV1) and press SW3 again. A new A/D conversion will be performed and the count of A/D conversions will be displayed in binary form using LED2 and LED3.

37. Click the 'Suspend' button. The program will stop and the source code will be opened at the current program counter.

38. To disconnect from the target board click the 'Disconnect' button on the toolbar; then select the C/C++ perspective (at the top right) to return to the editor view.

5. Running the Tutorial Sample Program from QSPI Flash

39. Power down the RSK+.

40. The 'Tutorial' sample is also programmed into the RSK+ QSPI FLASH. To run the program from the QSPI flash, first ensure that SW4 switches are set to the positions shown in the picture. SW4: 1=ON, 2=ON, 3=ON, 4=ON, 4=ON, 5=ON, 6=OFF.

41. Re-apply power to the RSK+.

42. Enter character 'c' on the serial terminal or press switch SW3 to perform an A/D conversion. The result will be displayed on the Pmod LCD.

43. Rotate the analog adjust control (RV1) and press SW3 again. A new A/D conversion will be performed and the count of A/D conversions will be displayed in binary form using LED2 and LED3.

6. Running the System_Input_Capture Sample Program from NOR Flash

44. Power down the RSK+.

45. The 'System_Input_Capture' sample is programmed into the RSK+ NOR FLASH. To run the program from NOR FLASH, first ensure that SW4 switches are set to the positions shown in the picture. SW4: 1=ON, 2=OFF, 3=ON, 4=ON, 4=ON, 5=ON, 6=OFF.

46. The RZ/T1 CPU is configured to enter the low power state 'Standby Mode' following reception of the 's' character from a serial terminal. The serial terminal settings from Step 10 are also valid for this sample.

47. Re-apply power to the RSK+.

48. Review the full instructions stated on the serial terminal before pressing character 'b' to begin.

49. The 'System_Input_Capture' sample logs a set of 16 byte data records to the external non-volatile memory (NVM) EEPROM device on the RSK+RZT1.

50. Each record is stored at regular timer intervals: 0.5 second, 1 second or 60 seconds. The interval is selected by pressing SW1, SW2 or SW3.
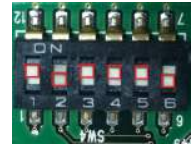
7. MAC Address

When running any Ethernet software, a unique MAC address should be used. A unique Renesas allocated MAC address is attached to the RSK+RZT1 PCB as a sticker, and should always be used with this device to ensure full compatibility when using other Renesas hardware on a common Ethernet connection.

8. Next Step

After you have completed this quick start procedure, please review the Tutorial code and other sample code that came with this kit. You can review the other samples using the sub-projects in the Project Explorer. The Tutorial Manual will help you understand the device and the development process using Renesas development tools.

The Hardware manual supplied with this RSK+ is current at the time of publication. Please check for any updates to the device manual from the Renesas internet site at www.renesas.com/rskrzt1. To learn more on how to use e² studio, open the program's help files by using Help > Help Contents.

9. User Manuals

User manuals can found in the Windows™ 7 Start Menu. (Start Menu > All Programs > Renesas Electronics Tools > RSK+RZT1 > Manuals).

For Windows™ 8.1, click the down arrow in the Start page. The user manuals are available in Apps > Renesas Electronics Tools.

10. Compiler Support

The version of the compiler provided with this RSK is a fully functional GNU compiler but requires registration before it can be used.

Support for the GNU NONE Compiler is available from http://www.kpitgnutools.com

11. Support

Online technical support and information is available at: http://www.renesas.com/rskrzt1

The Hardware Manual supplied with this RSK is current at the time of publication. Please check for any updates and additional content from the Renesas internet site at: http://www.renesas.com/rskrzt1

Technical Contact Details

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Europe: http://www.renesas.eu/ibg-kitsupport

Japan: csc@renesas.com

Website: http://www.renesas.com

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