QE for BLE[RA,RE] V1.2.0

Release Note

Thank you very much for your using the QE for BLE[RA,RE] V1.2.0.

This release documentation, we have indicated this product installation, restrictions and so on.

Contents

1. About QE for BLE[RA,RE]

1.1 Summary

QE for BLE[RA,RE] is a dedicated tool for developing Bluetooth® low energy-based embedded systems. This solution tool kit runs in the e² studio integrated development environment. The combination of e² studio and QE for BLE[RA,RE] makes it easy to test the communications features of RA4W1 group of RA family and RE01B group of RE family that supports BLE5, thus reducing the time required in developing a product prior to its release on the market.

1.2 Functions

Adding Bluetooth functions to a product requires the addition and customization of complex Bluetooth profiles. The QE for BLE[RA,RE] supports Bluetooth development for RA family devices with the following functions.

1. Designation of a profile provided by Bluetooth SIG

   Using R_BLE Custom Profile RA,RE (QE) View, you can generate code by designating a Bluetooth profile provided by Bluetooth SIG Inc. (https://www.bluetooth.com/).

2. Definition of a proprietary profile

   If you want to perform unique data communication (not through profiles provided by Bluetooth SIG), you must define a profile. Using R_BLE Custom Profile RA,RE (QE) View, you can modify a profile easily and generate code.

3. Configuration of advertising and scanning

   Supports the configuration of advertising and scanning, a feature of the BLE. Using R_BLE Custom Profile RA,RE (QE) View, you can easily configure the timing and frequency of advertising and scanning communication with the GUI.

4. Communication check by using a profile

   The QE for BLE[RA,RE] allows you to check profile-based communication by creating and executing a script using the API for the Bluetooth protocol stack

1.3 New Functions

1. RE01B is now supported
   QE for BLE[RA,RE] now supports Ultra-low Power MCU RE family RE01B.

1.4 Supported Environment

Microsoft Windows 8.1, Windows 10

Renesas e² studio 2021-01 (or later)

1.5 Supported Microcontroller

- RA4W1
- RE01B

1.6 Supported FSP Version

- RA4W1
  FSP V2.0.0 (or later)
- RE01B
  RE01B Group Bluetooth Low Energy Sample code (using CMSIS Driver Package) (R01AN5606)

2. Installation and Uninstallation

2.1 Installing This Product

Use either of the following procedure to install this product.

2.1.1 Install from the e² studio Installer

1. Start e² studio.
2. Select the [Renesas Views] – [Renesas Software Installer] menu of e² studio to open the [Renesas Software Installer] dialog box.
3. Select the [Renesas QE] and click the [Next>] button
4. Select the [QE for BLE[RA,RE] (v1.2.0)] check box, and click the [Finish] button.
5. Check that the [Renesas QE for BLE[RA,RE]] check box and the [Renesas QE for BLE[RA,RE] Utility] check box are selected in the [Install] dialog box, and click the [Next>] button.
6. Check that the [Renesas QE for BLE[RA,RE]] check box and the [Renesas QE for BLE[RA,RE] Utility] check box are selected as the target of installation, and click the [Next>] button.
7. After confirming the license agreements, if you agree to the license, select the [I accept the terms of the license agreements] radio button, and click the [Finish] button.
8. If the dialog of the trust certificate is displayed, check that certificate, and click the [OK] button to continue installation.
9. When prompted to restart e² studio, restart it.
10. Start this product from the [Renesas Views] - [Renesas QE] menu of e² studio. For details about how to use this product, see the [Help] menu of e² studio.

2.1.2 Using the QE Installer

1. Start e² studio.
2. From the [Help] menu, select [Install New Software...] to open the [Install] dialog box.
3. Click the [Add...] button to open the [Add Repository] dialog box.
4. Click the [Archive...] button, select the installation file (zip file) in the opened file selection dialog box, and then click the [Open] button.
5. Click the [OK] button in the [Add Repository] dialog box.
6. Expand the [Renesas QE] item shown in the [Install] dialog box, select the [Renesas QE for BLE[RA,RE]] check box and the [Renesas QE for BLE[RA,RE] Utility] check box, and then click the [Next>] button.
   * If you check off the [Contact all update sites during install to find required software] checkbox, you can shorten the installation time.
7. Check that the [Renesas QE for BLE[RA,RE]] and the [Renesas QE for BLE[RA,RE] Utility] are selected as the target of installation, and click the [Next>] button.
8. After confirming the license agreements, if you agree to the license, select the [I accept the terms of the license agreements] radio button, and click the [Finish] button.
9. If the dialog of the trust certificate is displayed, check that certificate, and click the [OK] button to continue installation.
10. When prompted to restart e² studio, restart it.
11. Start this product from the [Renesas Views] - [Renesas QE] menu of e² studio. For details about how to use this product, see the [Help] menu of e² studio.

2.2 Updating This Product

If you have already installed this product, you can update it in the same way as the procedure for installation.

2.3 Uninstalling This Product

Use the following procedure to uninstall this product.

1. Start e^2 studio.
2. Select [Help -> About e^2 studio] to open the [About e^2 studio] dialog box.
3. Click the [Installation Details] button to open the [e^2 studio Installation Details] dialog box.
4. Select [Renesas QE for BLE[RA,RE]] and [Renesas QE for BLE[RA,RE] Utility] displayed on the [Installed Software] tabbed page and click the [Uninstall...] button to open the [Uninstall] dialog box.
5. Check the displayed information and click the [Finish] button.
6. When prompted to restart e^2 studio, restart it.

3. Notes / Restrictions

3.1 Usage Considerations

Please pay attention to the following items.

3.1.1 Notes of [Working with views]

1. Floating an R_BLE Main RA,RE (QE) view may not display the contents of the floating view.

   Workaround:
   Do not float the R_BLE Main RA,RE (QE) view.

3.2 Functional Restrictions

QE for BLE[RA,RE] V1.2.0 has the following functional restrictions.

3.2.1 Restrictions for creating a custom profile

1. In the setting of Advertising Interval in the following three items of the [Peripheral] and [Central] tabs of the R_BLE Custom Profile RA,RE (QE) View, the error icon does not appear even if the value that exceeds the input limit is entered.
   - [Peripheral] tab → Advertising Data → Advertising Interval
   - [Peripheral] tab → Scan Response Data → Advertising Interval
   - [Central] tab → Scan Filter Data → Advertising Interval

   Workaround:
   When setting the Advertising Interval, make sure it is entered correctly in the range of 20 to 10240ms.

2. In the setting of [Scan Parameter] in the tree item of the [Central] tab of the [R_BLE Custom Profile RA,RE (QE)] View, if [Enable Fast Scan] is unchecked, Scan cannot be start. Because RM_BLE_ABS_StartScanning function fails using generated code by QE.

   MCU:
   RA4W1

   Workaround:
   After generating code, change Fast Scan Interval and Fast Scan Window value in app_main.c to more than 0x0004.

   Examples:

   Rewrite .fast_scan_interval and .fast_scan_window as follows.
   This example Rewrites them to the initial values of the [Fast Scan Interval] and [Fast Scan Window] in the setting of [Scan Parameter] on the [Central] tab.

```
/* Scan phy parameters */
static ble_abs_scan_phy_parameter_t gs_scan_phy_parameter =
{
    .fast_scan_interval    = 0x0060, /* <- Change 0x0000 to 0x0060 */
    .fast_scan_window      = 0x0030, /* <- Change 0x0000 to 0x0030 */
    .slow_scan_interval    = 0x0800, /* 1,280.0(ms) */
    .slow_scan_window      = 0x0012, /* 11.25(ms) */
    .scan_type             = BLE_GAP_SCAN_PASSIVE
};
```

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Mar.25.21	-	First edition issued.

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. Precaution against Electrostatic Discharge (ESD)

   A strong electrical field, when exposed to a CMOS device, can cause destruction of the gate oxide and ultimately degrade the device operation. Steps must be taken to stop the generation of static electricity as much as possible, and quickly dissipate it when it occurs. Environmental control must be adequate. When it is dry, a humidifier should be used. This is recommended to avoid using insulators that can easily build up static electricity. Semiconductor devices must be stored and transported in an anti-static container, static shielding bag or conductive material. All test and measurement tools including work benches and floors must be grounded. The operator must also be grounded using a wrist strap. Semiconductor devices must not be touched with bare hands. Similar precautions must be taken for printed circuit boards with mounted semiconductor devices.
2. Processing at power-on

   The state of the product is undefined at the time 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 time 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 time 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 time when power is supplied until the power reaches the level at which resetting is specified.
3. Input of signal during power-off state

   Do not input signals or an I/O pull-up power supply while the device is powered off. The current injection that results from input of such a signal or I/O pull-up power supply may cause malfunction and the abnormal current that passes in the device at this time may cause degradation of internal elements. Follow the guideline for input signal during power-off state as described in your product documentation.
4. 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 the 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.
5. Clock signals

   After applying a reset, only release the reset line after the operating clock signal becomes stable. When switching the clock signal during program execution, wait until the target clock signal is 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. Additionally, 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.
6. Voltage application waveform at input pin

   Waveform distortion due to input noise or a reflected wave may cause malfunction. If the input of the CMOS device stays in the area between V_{IL} (Max.) and V_{IH} (Min.) due to noise, for example, the device may malfunction. Take care to prevent chattering noise from entering the device when the input level is fixed, and also in the transition period when the input level passes through the area between V_{IL} (Max.) and V_{IH} (Min.).
7. Prohibition of access to reserved addresses

   Access to reserved addresses is prohibited. The reserved addresses are provided for possible future expansion of functions. Do not access these addresses as the correct operation of the LSI is not guaranteed.
8. Differences between products

   Before changing from one product to another, for example to a product with a different part number, confirm that the change will not lead to problems. The characteristics of a microprocessing unit or microcontroller unit products in the same group but having a different part number might differ in terms of 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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(Rev.5.0-1 October 2020)

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