

## Outline

We are contacting you with notes on the bootloader attached to the firmware update FIT and the bootloader to be used when performing Over The Air ("OTA") on FreeRTOS and Azure ROTS.

## 1. Note when using bootloader for firmware update FIT and OTA

### 1.1 Outline

When transitioning from the bootloader to the application, the peripherals used in the bootloader transition to the application in a state different from the device's initial state.

### 1.2 Applicable Products

Firmware update FIT:

RX Family Firmware Update Module Firmware Integration Technology Rev.1.06 (R01AN5824xJ0106) and all previous versions are applicable.

FreeRTOS:

V202002.00-rx-1.0.3 to V202107.00-rx-1.0.1 are applicable.

Can be specified from the following dialog when generating a project in e<sup>2</sup> studio.

RTOS:	FreeRTOS (with IoT libraries)(deprecated structure) ▾
RTOS Version:	202002.00-rx-1.0.3 ▾

Azure RTOS

V6.2.0\_rel-rx-1.0.0 to V6.2.1\_rel-rx-1.2.0 are applicable.

Can be specified from the following dialog when generating a project in e<sup>2</sup> studio.

RTOS:	Azure RTOS ▾
RTOS Version:	6.2.0_rel-rx-1.0.0 ▾

### 1.3 Applicable Devices

Firmware update FIT:

RX130 Group  
 RX140 Group  
 RX230, RX231, RX23E-A, RX23W Group  
 RX65N. RX651 Group  
 RX66N Group  
 RX66T Group  
 RX660 Group  
 RX671 Group  
 RX72M Group  
 RX72N Group

FreeRTOS and Azure RTOS:

CK-RX65N  
 Renesas Starter Kit+ for RX65N-2MB  
 Renesas Starter Kit+ for RX671  
 RX72N Envision Kit

## 1.4 Details and Conditions

The system timer used in the bootloader transitions to the user application in a state different from the initial state of the device when it transitions from the bootloader to the application. Therefore, depending on the application, the system timer may perform an unintended operation after the transition.

## 1.5 Workaround

Firmware update FIT:

Please implement one of the following workarounds.

Workaround1: Use Rev.2.00 or later version.

Workaround2: If you must use Rev.1.06 or earlier firmware update FIT.

Please add Close processing for the system timer used by the bootloader to the R\_FWUP\_ExecuteFirmware function in r\_fwup\_boot\_loader.c on the bootloader.

```
void R_FWUP_ExecuteFirmware(void)
{
    volatile uint32_t addr;

    fwup_state_monitoring_close();
    R_BSP_InterruptRequestDisable(VECT(CMT0, CMI0));

    /* stop all interrupt completely */
    R_BSP_SET_PSW(0);
    addr = *(uint32_t*) USER_RESET_VECTOR_ADDRESS;
    ((void (*)(void)) addr)();
}
```

Workaround3: If you must use Rev.1.06 or earlier firmware update FIT and cannot change the bootloader.

Please add an interrupt countermeasure for the system timer used by the bootloader to the R\_BSP\_POR\_FUNCTION function in resetprg.c on the application program.

```
R_BSP_POR_FUNCTION(R_BSP_STARTUP_FUNCTION)
{
    :
    :
    CMT.CMSTR0.WORD = 0x0000;
    R_BSP_InterruptRequestDisable(VECT(CMT0, CMI0));
    IR(CMT0, CMI0) = 0;
    SYSTEM.PRCR.WORD = 0xA502;
    MSTP(CMT0) = 1;
    SYSTEM.PRCR.WORD = 0xA500;

    /* Initialize MCU interrupt callbacks. */
    bsp_interrupt_open();
    :
    :
}
```

If workaround 2 or 3 is selected.

In addition to the above, the settings of peripheral functions set in the bootloader are inherited by the application side. It is recommended to initialize the settings of the peripheral functions before moving from the bootloader to the application or to share the settings of the application and the peripheral functions.

The target peripheral functions are as follows.

- RX Family Board Support Package Module Using Firmware Integration Technology (R01AN1685)
- RX Family Flash Module Using Firmware Integration Technology (R01AN2184)
- RX Family SCI Module Using Firmware Integration Technology (R01AN1815)

For details, please refer to the application note and sample program of the RX Family Firmware Update Module Firmware Integration Technology (R01AN5824JJ0106).

FreeRTOS:

Please implement Workaround 3.

Azure RTOS:

Please implement Workaround 2.

### 1.6 Schedule for Fixing the Problem

Firmware update FIT:

Rev.2.00 or later versions have already fixed the problem. For new development should use Rev.2.00 or later.

FreeRTOS / Azure RTOS:

Fixing of the problem is under consideration for the next version.

**Revision History**

Rev.	Date	Description	
		Page	Summary
1.00	Oct.1.23	-	First edition issued

Renesas Electronics has used reasonable care in preparing the information included in this document, but Renesas Electronics does not warrant that such information is error free. Renesas Electronics assumes no liability whatsoever for any damages incurred by you resulting from errors in or omissions from the information included herein.

The past news contents have been based on information at the time of publication. Now changed or invalid information may be included.

The URLs in the Tool News also may be subject to change or become invalid without prior notice.

**Corporate Headquarters**

TOYOSU FORESIA, 3-2-24 Toyosu,  
Koto-ku, Tokyo 135-0061, Japan

[www.renesas.com](http://www.renesas.com)

**Trademarks**

Renesas and the Renesas logo are trademarks of Renesas Electronics Corporation. All trademarks and registered trademarks are the property of their respective owners.

**Contact information**

For further information on a product, technology, the most up-to-date version of a document, or your nearest sales office, please visit:

[www.renesas.com/contact/](http://www.renesas.com/contact/)