

[Notes]RX Family

R20TS0967EJ0100

Rev.1.00

Oct.1.23

Note when using bootloader for firmware update FIT and OTA

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 e² 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 e² 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

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