

RENESAS TOOL NEWS on July 1, 2013: 130701/tn6

Note on Using Renesas Peripheral Driver Libraries for RX62T/RX62N/RX621/RX210 Groups of MCUs and Peripheral Driver Generator -- With Using Callback Function for I2C Bus Interface (RIIC) to Send Slave Address --

When using Renesas Peripheral Driver Libraries for the RX62T/RX62N/RX621/ RX210 Groups of MCUs and Peripheral Driver Generator, take note of the following problem:

- With using a callback function for the I2C bus interface (RIIC) to send a slave address
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1. Products and Versions Concerned

- RX62T Group Renesas Peripheral Driver Library V.1.01 (see NOTE)
- RX62N, RX621 Group Renesas Peripheral Driver Library V.1.02
- RX210 Group Renesas Peripheral Driver Library V.1.01
- Peripheral Driver Generator V.2.01 or later

NOTE:

This problem does not occur in RX62G, RX62T Group Renesas Peripheral Driver Library V.1.01, which supports both the RX62G and RX62T groups of MCUs.

2. Description

In each of the following two cases, if an attempt is made to use a callback function for the RIIC to send a slave address, the slave address is not sent.

2.1 In Renesas Peripheral Driver Library

This problem occurs when both R_IIC_MasterSend and R_IIC_MasterReceive function, or either of them is recalled inside the callback function of the prior R_IIC_MasterSend or R_IIC_MasterReceive function.

2.2 In Peripheral Driver Generator

This problem arises when the following conditions are all satisfied:

- (1) In project creation, the RX62T, RX62N (include RX621), or RX210 group of MCUs is specified for the Type of CPU box in the Project new dialog box.
- (2) In the RIIC tab, Device attribute for RIIC0 (channel 0) or RIIC1 (channel 1) is set to Master or Master and slave.
- (3) In the RIIC channel selected in (2) above, either or both of the following settings are selected for Transmission and reception method.
 - For Master reception method, Notify the reception completion of all data by function call is selected.
 - For Master transmission method, Notify the transmission completion of all data by function call is selected.
- (4) The R_PG_I2C_MasterReceive_Cn function generated by the Peripheral Driver Generator is used for master reception, or the R_I2C_MasterSend_Cn function or the R_PG_I2C_MasterSendWithoutStop_Cn function (n = 0 or 1) is used for master transmission.

3. Workaround

3.1 In RX62T Group Renesas Peripheral Driver Library

Use the updated version that has fixed the problem:

RX62G, RX62T Group Renesas Peripheral Driver Library V.1.01.

For details of the product, see RENESAS TOOL NEWS Document No.121201/tn2 at:

<https://www.renesas.com/search/keyword-search.html#genre=document&q=121201tn2>

3.2 In RX210 Group Renesas Peripheral Driver Library

Use the updated version that has fixed the problem:

RX210 Group Renesas Peripheral Driver Library V.2.00.

For details of the product, see RENESAS TOOL NEWS Document No.130701/tn7 at:

<https://www.renesas.com/search/keyword-search.html#genre=document&q=130701tn7>

3.3 In RX62N, RX621 Group Renesas Peripheral Driver Library and Peripheral Driver Generator

As shown in the following example, add the processing for clearing the IR bit for the TXI interrupt in the Interrupt_IIC_ICEEI function in the Interrupt_IIC.c file.

NOTE:

Before generating a source file using the Peripheral Driver Generator, correct the Interrupt_IIC.c file in source¥RX¥<type name>¥i_src in the directory where the Peripheral Driver Generator has been installed.

<type name> depends on the installed Peripheral Driver Generator as shown below.

When generating code for the RX62T group by the Peripheral Driver Generator

```
source¥RX¥RX62T¥i_src
```

When generating code for the RX62N group by the Peripheral Driver Generator

```
source¥RX¥RX62N¥i_src
```

When generating code for the RX210 group by the Peripheral Driver Generator

```
source¥RX¥RX210¥i_src
```

Example of Interrupt_IIC.c file correction (example for channel 0):

```
-----  
/*** Start of Change 1 ***/  
/* Add IR bit definition for the TXI interrupt in the RIIC. */  
/* This definition uses a macro of C language. Input the channel  
   number of RIIC in "a". */  
#define ICTXI_ADDRESS(a) ( (volatile uint8_t __evenaccess *)&  
ICU.IR[IR_RIIC0_ICTXI0] + ((4 * a) / sizeof(uint8_t)) )  
/*** End of Change 1 ***/  
  
void Interrupt_IIC_ICEEI0(void)  
{  
    uint8_t valid_flags;  
    volatile uint8_t unwanted_byte;  
  
    /* Read the status register */  
    valid_flags = RIIC0.ICSR2.BYTE;  
  
    .....  
    /* Decide what to send */  
    switch(rpdl_IIC_next_state[0])  
    {  
        case IIC_MASTER_SEND_SLAVE_ADDRESS_7:  
            /* Send the slave address */  
            /*** Start of Change 2 ***/  
            *ICTXI_ADDRESS(0) = 0x0u; // Add processing for clearing  
                                     // IR bit for TXI.  
            /*** End of Change 2 ***/  
  
            RIIC0.ICDRT = rpdl_IIC_slave_address_lower[0];
```

```

/* Transmit mode? */
if ((rpdI_IIC_slave_address_lower[0] & BIT_0) == 0)
{
    rpdI_IIC_current_state[0] = IIC_MASTER_SEND_DATA;
}
else
{
    rpdI_IIC_current_state[0] = IIC_MASTER_START_READ;
}
break;
case IIC_MASTER_SEND_SLAVE_ADDRESS_10a:
    /*** Start of Change 3 ***/
    *ICTXI_ADDRESS(0) = 0x0u; // Add processing for clearing
                            // IR bit for TXI.
    /*** End of Change 3 ***/

    rpdI_IIC_current_state[0] = IIC_MASTER_SEND_SLAVE_ADDRESS_10b;

    /* Send the first part of the slave address */
    RIIC0.ICDRT = rpdI_IIC_slave_address_upper[0];
    break;
default:
    break;
.....
-----

```

4. Schedule for Fixing Problem

(1) Renesas Peripheral Driver Library

- RX62T group

Sorry we have no plan to fix this problem in RX62T Group Renesas Peripheral Driver Library V.1.01, which supports only the RX62T group of MCUs.

So use the updated version that has fixed the problem:

RX62G, RX62T Group Renesas Peripheral Driver Library V.1.01.

- RX62N and RX621 groups

For RX62N, RX621 Group Renesas Peripheral Driver Library, we plan to fix this problem in a future version.

- RX210 group

In RX210 Group Renesas Peripheral Driver Library, this problem has already been fixed in V.2.00.

(2) Peripheral Driver Generator

For Peripheral Driver Generator, we plan to fix this problem
in a future version.

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