

[Notes]

R20TS0522ES0100

Rev.1.00

Dec. 16, 2019

e² studio Smart Configurator Plug-in, Smart Configurator for RX

Outline

When using the e² studio Smart Configurator Plug-in and Smart Configurator for RX, note the following points.

1. When using the comparison function of the 12-bit A/D converter
2. When using the real-time clock in calendar count mode
3. When using the 12-bit A/D converter in continuous scan mode
4. When using the 12-bit A/D converter in single scan mode

1. When Using the Comparison Function of the 12-bit A/D Converter

1.1 Applicable Products

- e² studio V5.3.0 (Smart Configurator Plug-in V1.1.0) or later
- Smart Configurator for RX V1.1.0 or later

1.2 Applicable Devices

- RX family:
RX651, RX65N, RX66T, RX72T, and RX72M groups

1.3 Details

RX651, RX65N groups:

When using Single Scan Mode, Group Scan Mode, or Continuous Scan Mode, the following error occurs.

- (a) When Temperature sensor output or Internal reference voltage is used for window A in the comparison function, all window B GUI settings are not disabled.
For details, see Figure 1.1.
- (b) When Temperature sensor output or internal reference voltage is used for window B in the comparison function, all window A GUI settings are not disabled.
For details, see Figure 1.2.

☐ AN100 ☐ AN101 ☐ AN102 ☐ AN103 ☐ AN104
☐ AN105 ☐ AN106 ☐ AN107 ☐ AN108 ☐ AN109
☐ AN110 ☐ AN111 ☐ AN112 ☐ AN113 ☐ AN114
☐ AN115 ☐ AN116 ☐ AN117 ☐ AN118 ☐ AN119
☒ AN120 ☒ Temperature sensor output ☐ Internal reference voltage

☒ Enable comparison window A ☒ Enable comparison window B
 Window A/B complex condition Window A comparison condition matched OR window B comparison condition matched

Temperature sensor output is used for window A
☒ Use comparator for Temperature sensor output Reference data 0 < A/D-converted value
☐ Use comparator for Internal reference voltage Reference data 0 > A/D-converted value

A/D comparison B setting
 Reference data 0 for comparison 0
 Reference data 1 for comparison 0
 Comparison B channel AN120
 Reference data 0 > A/D-converted value

But window B settings are still able for operation, correct UI behaviour: all window B settings are greyed out

Figure 1.1 Example of using Temperature sensor output for window A while using Single Scan Mode

☐ AN100 ☐ AN101 ☐ AN102 ☐ AN103 ☐ AN104
☐ AN105 ☐ AN106 ☐ AN107 ☐ AN108 ☐ AN109
☐ AN110 ☐ AN111 ☐ AN112 ☐ AN113 ☐ AN114
☐ AN115 ☐ AN116 ☐ AN117 ☐ AN118 ☐ AN119
☒ AN120 ☒ Temperature sensor output ☐ Internal reference voltage

☒ Enable comparison window A ☒ Enable comparison window B

Window A/B complex condition Window A comparison condition matched OR window B comparison condition matched

☐ Use comparator for AN119 Reference data 0 > A/D-converted value
☒ Use comparator for AN120 Reference data 0 > A/D-converted value
☐ Use comparator for Temperature sensor output Reference data 0 < A/D-converted value
☐ Use comparator for Internal reference voltage Reference data 0 > A/D-converted value

A/D comparison B setting
 Reference data 0 for comparison 0
 Reference data 1 for comparison 0

Comparison B channel Temperature sensor output Reference data 0 > A/D-converted value

But window A settings are still able for operation, correct UI behaviour: all window A settings are greyed out

Temperature sensor output is used for window B

Figure 1.2 Example of using Temperature sensor output for window B while using Single Scan Mode

RX66T, RX72T groups:

When using Group Scan Mode, the following error occurs.

- (a) When Temperature sensor output or Internal reference voltage is used for window B in the comparison function, all window A GUI settings are not disabled.
For details, see Figure 1.3.

①

AN211	☒	☐	☐	☐
AN216	☐	☒	☐	☐
AN217	☐	☒	☐	☐
Temperature sensor output	☐	☐	☒	☐
Internal reference voltage	☒	☐	☐	☐

⋮

Window function setting

☒ Disable ☐ Enable

Window A/B operation setting

② ☒ Enable comparison window A ☒ Enable comparison window B

⋮

☐ Use comparator for AN216	Reference data 0 > A/D-conv	But window A settings for analog pins are still able for operation, correct UI behaviour: all window A settings are greyed out
☐ Use comparator for AN217	Reference data 0 > A/D-conv	
☐ Use comparator for Temperature sensor output	Reference data 0 > A/D-conv	
☐ Use comparator for Internal reference voltage	Reference data 0 > A/D-conv	

⋮

A/D comparison B setting

Reference data 0 for comparison: 0

Reference data 1 for comparison: 0

③ Comparison B channel: Temperature sensor output

Reference data 0 > A/D-converted value

Figure 1.3 Example of using Temperature sensor output for window B while using Group Scan Mode

RX72M group:

When using Group Scan Mode, the following error occurs.

- (a) When Temperature sensor output or Internal reference voltage is used for window B in the comparison function, all window A GUI settings are not disabled.
For details, see Figure 1.4.

①

AN117	☒	☐	☐	☐
AN118	☐	☒	☐	☐
AN119	☐	☒	☐	☐
AN120	☐	☒	☐	☐
Temperature sensor output	☐	☒	☐	☐
Internal reference voltage	☒	☐	☐	☐

②

Window function setting

☒ Disable ☐ Enable

Window A/B operation setting

☒ Enable comparison window A ☒ Enable comparison window B

☐ Use comparator for AN117

Reference data 0 > A/D-converted value

☒ Use comparator for AN118

Reference data 0 > A/D-converted value

☒ Use comparator for AN119

Reference data 0 > A/D-converted value

☒ Use comparator for AN120

Reference data 0 > A/D-converted value

☐ Use comparator for Temperature sensor output

Reference data 0 > A/D-converted value

☐ Use comparator for Internal reference voltage

Reference data 0 > A/D-converted value

③

A/D comparison B setting

Reference data 0 for comparison

0

Reference data 1 for comparison

0

Comparison B channel

Temperature sensor output

Reference data 0 > A/D-converted value

GUI settings for analog pins are greyed out but register settings codes are still generated out (Figure 1.5)

Temperature sensor output is used for window B

Figure 1.4 Example of using Temperature sensor output for window B and Group Scan Mode

```

/*****
* Function Name: R_Config_S12AD1_Create
* Description   : This function initializes the S12AD1 channel
* Arguments    : None
* Return Value  : None
*****/

void R_Config_S12AD1_Create(void)
{
    /* Cancel S12AD1 module stop state */
    MSTP(S12AD1) = 0U;
    MSTP(TEMPS) = 0U;

    .....

    /* Set compare control register */
    S12AD1.ADCMPANSR1.WORD = _0004_AD_AN118_CMPA_USED | _0008_AD_AN119_CMPA_USED |
    _0010_AD_AN120_CMPA_USED;
    S12AD1.ADCMPBNSR.BYTE = _20_AD1_TEMP_CMPB_CHANNEL | _00_AD_CMPB_LEVEL0;
    S12AD1.ADCMPLR1.WORD = _0000_AD_AN118_CMPA_LEVEL0 | _0000_AD_AN119_CMPA_LEVEL0 |
    _0000_AD_AN120_CMPA_LEVEL0;
    S12AD1.ADWINLLB = 0x0000U;
    S12AD1.ADCMPCR.WORD = _0200_AD_WINDOWB_ENABLE | _2000_AD_COMPAREB_INTERRUPT_ENABLE |
    _0000_AD_WINDOWFUNCTION_DISABLE;

    .....

    R_Config_S12AD1_Create_UserInit();
}

```

These codes should not be generated out as their GUI settings are greyed out

Figure 1.5 Example of codes generated for the items that are grayed out in the GUI settings

1.4 Workaround

RX651, RX65N groups:

Don't configure any comparison window B GUI setting when temperature sensor output or internal reference voltage is used for comparison window A; don't configure any comparison window A GUI setting when temperature sensor output or internal reference voltage is used for comparison window B.

Examples of workarounds are shown in Figure 1.6 through Figure 1.9.

Temperature sensor output is used for window A

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

① ☒ Use comparator for Temperature sensor output

☐ Use comparator for Internal reference voltage

Reference data 0 > A/D-converted value

Reference data 0 < A/D-converted value

Reference data 0 > A/D-converted value

A/D comparison B setting

Reference data 0 for comparison

Reference data 1 for comparison

Comparison B channel

② Don't configure any comparison window B GUI settings (GUI items within A/D comparison B setting group box)

Reference data 0 > A/D-converted value

Figure 1.6 Workaround when Temperature sensor output is used for comparison window A

Internal reference voltage is used for window A

or output

1 ☒ Use comparator for Internal reference voltage

Reference data 0 > A/D-converted value

Reference data 0 < A/D-converted value

2 Don't configure any comparison window B GUI settings (GUI items within A/D comparison B setting group box)

Reference data 0 > A/D-converted value

R20TS0522ES0100 Rev.1.00
Dec.16.19

A/D comparison A setting

Reference data 0 for comparison0

Reference data 1 for comparison0

☐ Use comparator for AN100

☐ Use comparator for AN101

☐ Use comparator for AN102

⋮

☐ Use comparator for AN118

☐ Use comparator for AN119

☐ Use comparator for AN120

☐ Use comparator for Temperature sensor output

☐ Use comparator for Internal reference voltage

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 < A/D-converted value

Reference data 0 > A/D-converted value

2

Don't configure any comparison window A GUI settings (GUI items within A/D comparison A setting group box)

A/D comparison B setting

Reference data 0 for comparison0

Reference data 1 for comparison0

1

Comparison B channel

Internal reference voltage

Reference data 0 > A/D-converted value

Internal reference voltage is used for window B

Figure 1.9 Workaround when Internal reference voltage is used for comparison window B

RX66T, RX72T groups:

Don't configure any window A GUI settings for analog pins when temperature sensor output or internal reference voltage is used for comparison window B.

Examples of workarounds are shown in Figure 1.10 and Figure 1.11.

The screenshot displays the 'A/D comparison A setting' and 'A/D comparison B setting' sections. In the 'A setting', a red box labeled '2' highlights the 'Use comparator for AN2xx' options, with a callout stating: 'Don't configure any comparison window A GUI settings for analog pins (GUI items named with "Use comparator for AN2xx")'. In the 'B setting', a red box labeled '1' highlights the 'Comparison B channel' dropdown, which is set to 'Temperature sensor output'. A callout next to it states: 'Temperature sensor output is used for window B'. The 'Reference data 0' and 'Reference data 1' for both windows are set to '0'.

Figure 1.10 Workaround when Temperature sensor output is used for comparison window B

A/D comparison A setting

Reference data 0 for comparison

0

Reference data 1 for comparison

0

☐ Use comparator for AN200

☐ Use comparator for AN201

☐ Use comparator for AN202

☐ Use comparator for AN211

☐ Use comparator for AN216

☐ Use comparator for AN217

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

2

Don't configure any comparison window A GUI settings for analog pins (GUI items named with "Use comparator for AN2xx")

A/D comparison B setting

Reference data 0 for comparison

0

Reference data 1 for comparison

0

1

Comparison B channel

Internal reference voltage

Internal reference voltage is used for window B

Reference data 0 > A/D-converted value

Figure 1.11 Workaround when Internal reference voltage is used for comparison window B

RX72M group:
Assure all window A GUI settings for analog pins are in unchecked status when Temperature sensor output or Internal reference voltage is used for comparison window B.
Examples of workarounds are shown in Figure 1.12 and Figure 1.13.

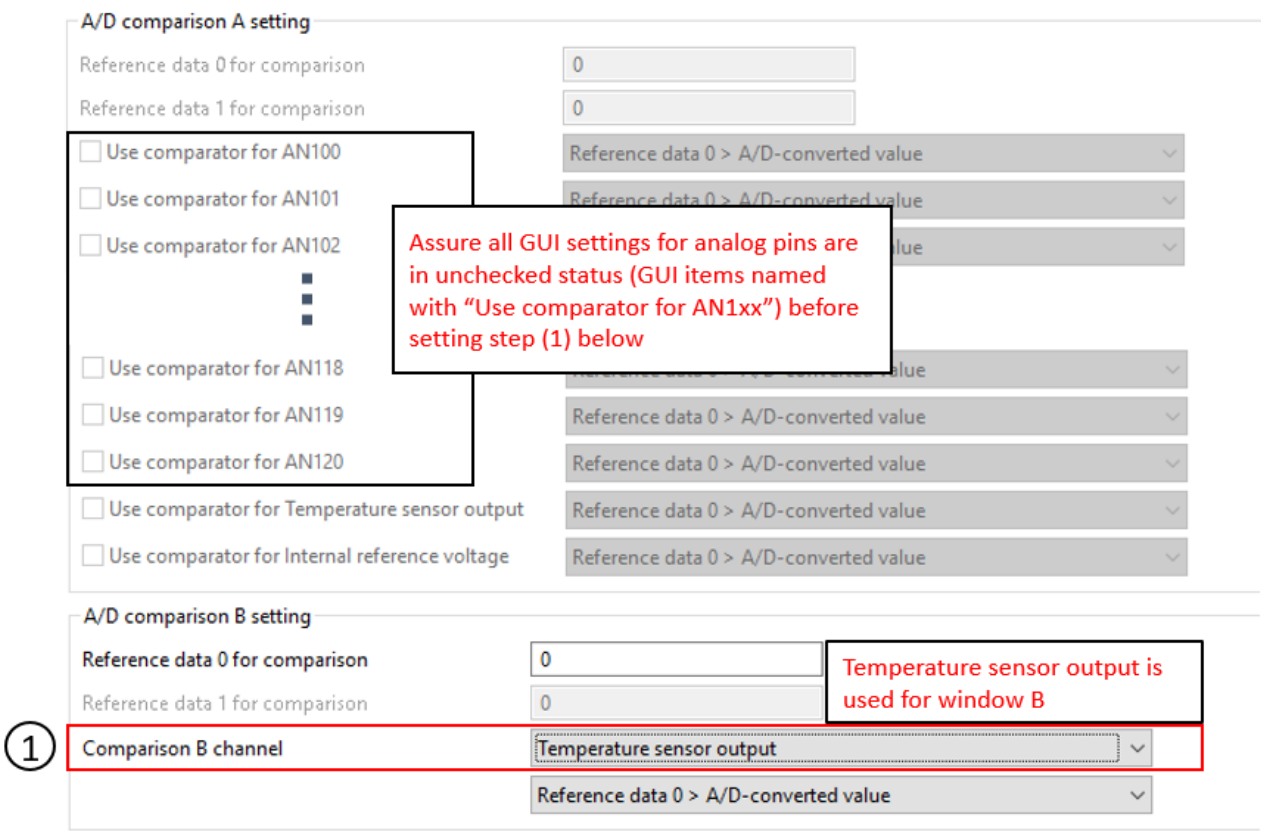


Figure 1.12 Workaround when Temperature sensor output is used for comparison B

A/D comparison A setting

Reference data 0 for comparison: 0

Reference data 1 for comparison: 0

☐ Use comparator for AN100
☐ Use comparator for AN101
☐ Use comparator for AN102
 ■
☐ Use comparator for AN118
☐ Use comparator for AN119
☐ Use comparator for AN120

☐ Use comparator for Temperature sensor output
☐ Use comparator for Internal reference voltage

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

Reference data 0 > A/D-converted value

A/D comparison B setting

Reference data 0 for comparison: 0

Reference data 1 for comparison: 0

① Comparison B channel: Internal reference voltage

Reference data 0 > A/D-converted value

Internal reference voltage is used for window B

Assure all GUI settings for analog pins are in unchecked status (GUI items named with "Use comparator for AN1xx") before setting step (1) below

Figure 1.13 Workaround when Internal reference voltage is used for comparison B

1.5 Schedule for Fixing the Problem

This problem will be fixed in the Smart Configurator for RX V2.4.0 / e² studio V7.7.0 (Scheduled to be released in January 2020.)

2. When Using the Real-time Clock in Calendar Count Mode

2.1 Applicable Products

- e2 studio V6.0.0 (Smart Configurator Plug-in V1.2.0) or later
- Smart Configurator for RX V1.2.0 or later

2.2 Applicable Devices

- RX family:
RX651, RX65N groups

2.3 Details

When using the calendar API to set the counter value while using the real-time clock in calendar count mode, the statement for waiting the completion of reset operation is incorrect and may cause an infinite loop.

Error location

```

/*****
*****
* Function Name: R_Config_RTC_Set_CalendarCounterValue
* Description  : This function set RTC calendar counter value
* Arguments   : counter_write_val -
*               counter write value
* Return Value : None
*****
*****/

void R_Config_RTC_Set_CalendarCounterValue(rtc_calendarcounter_value_t counter_write_val)
{
    uint32_t rw_count;
    volatile uint32_t dummy;

    /* Stop all counters */
    RTC.RCR2.BIT.START = 0U;
    while (0U != RTC.RCR2.BIT.START)
    {
        /* Ensure the clock is stopped while configuring it. */
    }

    /* Execute RTC software reset */
    RTC.RCR2.BIT.RESET = 1U;
    while (1U != RTC.RCR2.BIT.RESET)
    {
        /* Wait for the reset to complete */
    }

    .....
}

```

Need to wait for the RESET bit value to become 0 instead of 1

2.4 Workaround

Manually change the checking value in the while statement from 1 to 0.

Note: When code is generated again, generated code returns to the state before modification. Therefore, modify the source file each time you generate code.

- Source file: "<RTC-configuration-name>.c"
- Function: "void R_<RTC-configuration-name>_Set_CalendarCounterValue (rtc_calendarcounter_value_t counter_write_val)"

The <RTC-configuration-name> varies depending on the selected component of RTC.

Below is the example of modification when the <RTC-configuration-name> is Config_RTC (initial value) for RX651

Workaround

```

/*****
* Function Name: R_Config_RTC_Set_CalendarCounterValue
* Description  : This function set RTC calendar counter value
* Arguments   : counter_write_val -
*               counter write value
* Return Value : None
*****/

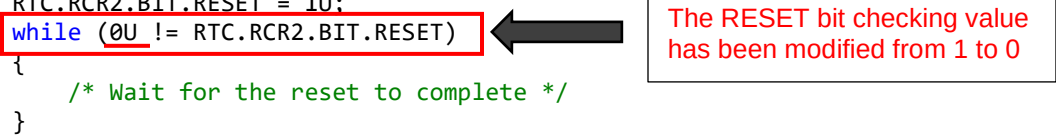
void R_Config_RTC_Set_CalendarCounterValue(rtc_calendarcounter_value_t counter_write_val)
{
    uint32_t rw_count;
    volatile uint32_t dummy;

    /* Stop all counters */
    RTC.RCR2.BIT.START = 0U;
    while (0U != RTC.RCR2.BIT.START)
    {
        /* Ensure the clock is stopped while configuring it. */
    }

    /* Execute RTC software reset */
    RTC.RCR2.BIT.RESET = 1U;
    while (0U != RTC.RCR2.BIT.RESET)
    {
        /* Wait for the reset to complete */
    }

    .....
}

```



The RESET bit checking value has been modified from 1 to 0

2.5 Schedule for Fixing the Problem

This problem will be fixed in the Smart Configurator for RX V2.4.0 / e² studio V7.7.0 (Scheduled to be released in January 2020.)

3. When Using the 12-bit A/D Converter in Continuous Scan Mode

3.1 Applicable Products

- e² studio V7.5.0 (Smart Configurator Plug-in V2.2.0) or later
- Smart Configurator for RX V2.2.0 or later

3.2 Applicable Devices

- RX family:
RX72M group

3.3 Details

When using Continuous Scan Mode of the 12-bit A/D converter, even if you select a different conversion resolution, the input range of the following items for the comparison function for window B is not updated correctly (fixed at 0 to 4095). As a result of this, a value that is outside the input range can be configured without causing an error.

- Reference data 0 for comparison
- Reference data 1 for comparison

Error location:

Data registers setting

Data placement	Right-alignment
Automatic clearing	Disable automatic clearing
Conversion resolution	12-bit accuracy
Addition/Average mode select	Addition mode
Addition count	1-time

Window function setting

☐ Disable ☒ Enable

Window A/B operation setting

☐ Enable comparison window A ☒ Enable comparison window B

A/D comparison B setting

Reference data 0 for comparison	0
Reference data 1 for comparison	0

Select a different conversion resolution (e.g. 10-bit accuracy)

Check the input range of reference data 0 and data 1 (double-click inside the textbox and observe the output message on the console), the range is not updated with different selection in step (3)

Figure 3.1 Step 1 through 4 and error location

3.4 Workaround

To input value for the reference data 0 for comparison and reference data 1 for comparison while using the comparison function for window B, refer to the following table to set value within the input range.

Addition/Average function channel & mode select	Conversion resolution	Addition count	Input range
Channel is selected * & addition mode is chosen	12-bit accuracy	16-times	0~65535
		Not 16-times	0~16383
	10-bit accuracy	Don't care	0~4095
	8-bit accuracy	Don't care	0~1023
Channel is not selected, or average mode is chosen	12-bit accuracy	-	0~4095
	10-bit accuracy	-	0~1023
	8-bit accuracy	-	0~255

*Channel is selected means any analog channel checkbox is checked as below

▼ Advance setting

Add/Average AD value setting

☒ AN000
 ☐ AN001
 ☐ AN002
 ☐ AN003
 ☐ AN004
 ☐ AN005
 ☐ AN006
 ☐ AN007

3.5 Schedule for Fixing the Problem

This problem will be fixed in the Smart Configurator for RX V2.4.0 / e² studio V7.7.0 (Scheduled to be released in January 2020.)

4. When Using the 12-bit A/D Converter in Single Scan Mode

4.1 Applicable Products

- e² studio V5.2.0 (Smart Configurator Plug-in V1.0.0) or later
- Smart Configurator for RX V1.0.0 or later

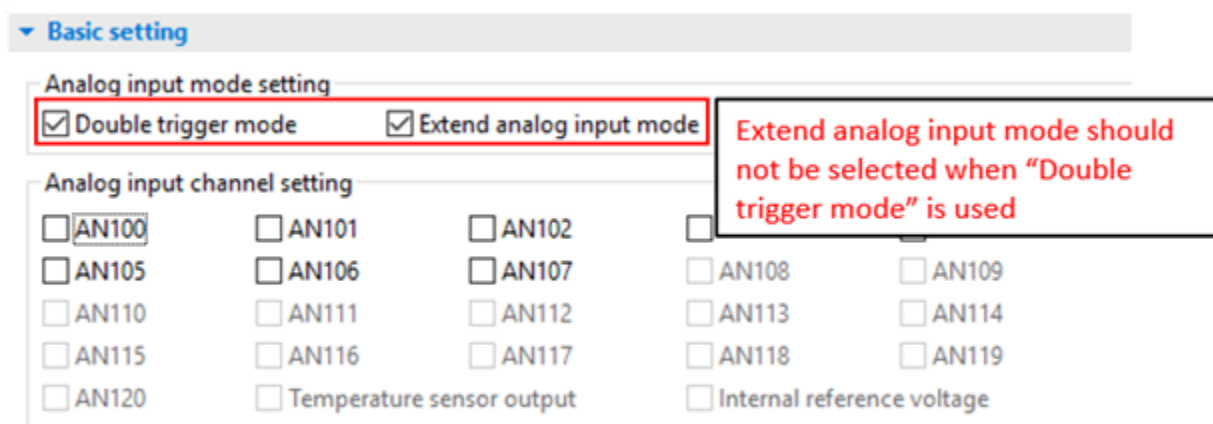
4.2 Applicable Devices

- RX family:
RX64M, RX651, RX65N, RX71M and RX72M groups
- Channels:
S12AD1 only

4.3 Details

When using Double trigger mode on Single Scan Mode component of the 12-bit A/D converter, “Extend analog input mode” is still available for configuration even though it cannot be used simultaneously.

Error location:



4.4 Workaround

When using Double trigger mode, don't select “Extend analog input mode” simultaneously.

4.5 Schedule for Fixing the Problem

This problem will be fixed in the Smart Configurator for RX V2.4.0 / e² studio V7.7.0 (Scheduled to be released in January 2020.)

Revision History

Rev.	Date	Description	
		Page	Summary
1.00	Dec..16.19	-	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.

URLs in 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

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/

Trademarks

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

© 2019 Renesas Electronics Corporation. All rights reserved.

TS Colophon 4.0