

[Notes]

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## e<sup>2</sup> studio Smart Configurator Plug-in, Smart Configurator for RX

### Outline

When using the e<sup>2</sup> 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

- e<sup>2</sup> 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.

Analog input channel setting

<input type="checkbox"/> AN100	<input type="checkbox"/> AN101	<input type="checkbox"/> AN102	<input type="checkbox"/> AN103	<input type="checkbox"/> AN104
<input type="checkbox"/> AN105	<input type="checkbox"/> AN106	<input type="checkbox"/> AN107	<input type="checkbox"/> AN108	<input type="checkbox"/> AN109
<input type="checkbox"/> AN110	<input type="checkbox"/> AN111	<input type="checkbox"/> AN112	<input type="checkbox"/> AN113	<input type="checkbox"/> AN114
<input type="checkbox"/> AN115	<input type="checkbox"/> AN116	<input type="checkbox"/> AN117	<input type="checkbox"/> AN118	<input type="checkbox"/> AN119
<input checked="" type="checkbox"/> AN120	<input checked="" type="checkbox"/> Temperature sensor output	<input type="checkbox"/> Internal reference voltage		

Window A/B operation setting

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 v

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

Analog input channel setting

<input type="checkbox"/> AN100	<input type="checkbox"/> AN101	<input type="checkbox"/> AN102	<input type="checkbox"/> AN103	<input type="checkbox"/> AN104
<input type="checkbox"/> AN105	<input type="checkbox"/> AN106	<input type="checkbox"/> AN107	<input type="checkbox"/> AN108	<input type="checkbox"/> AN109
<input type="checkbox"/> AN110	<input type="checkbox"/> AN111	<input type="checkbox"/> AN112	<input type="checkbox"/> AN113	<input type="checkbox"/> AN114
<input type="checkbox"/> AN115	<input type="checkbox"/> AN116	<input type="checkbox"/> AN117	<input type="checkbox"/> AN118	<input type="checkbox"/> AN119
<input checked="" type="checkbox"/> AN120	<input checked="" type="checkbox"/> Temperature sensor output		<input type="checkbox"/> Internal reference voltage	

⋮

Window A/B operation setting

Ⓐ  Enable comparison window A     Enable comparison window B

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

⋮

<input type="checkbox"/> Use comparator for AN119	Reference data 0 > A/D-converted value
<input checked="" type="checkbox"/> Use comparator for AN120	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for Temperature sensor output	Reference data 0 < A/D-converted value
<input type="checkbox"/> Use comparator for Internal reference voltage	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

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

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	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
AN216	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
AN217	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Temperature sensor output	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Internal reference voltage	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Window function setting  
 Disable  Enable

2

Window A/B operation setting  
 Enable comparison window A  Enable comparison window B

<input type="checkbox"/> 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
<input type="checkbox"/> Use comparator for AN217	Reference data 0 > A/D-conv	
<input type="checkbox"/> Use comparator for Temperature sensor output	Reference data 0 > A/D-conv	
<input type="checkbox"/> 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.

The screenshot shows the following configuration details:

- Comparator Selection (1):** A table with columns for AN117, AN118, AN119, AN120, Temperature sensor output, and Internal reference voltage. Each row has four radio buttons. AN118, AN119, AN120, and Temperature sensor output are selected (indicated by a filled circle).
- Window function setting:** Radio buttons for 'Disable' (selected) and 'Enable'.
- Window A/B operation setting (2):** Checkboxes for 'Enable comparison window A' and 'Enable comparison window B', both of which are checked.
- Comparator Usage:** A list of checkboxes for 'Use comparator for AN117' through 'Internal reference voltage'. AN118, AN119, and AN120 are checked. The corresponding reference data dropdowns are greyed out.
- A/D comparison B setting (3):** Input fields for 'Reference data 0 for comparison' and 'Reference data 1 for comparison', both set to '0'. The 'Comparison B channel' dropdown is set to 'Temperature sensor output'.

Callouts in the image:

- A grey box notes: "GUI settings for analog pins are greyed out but register settings codes are still generated out (Figure 1.5)".
- A red box notes: "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 grayed 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.

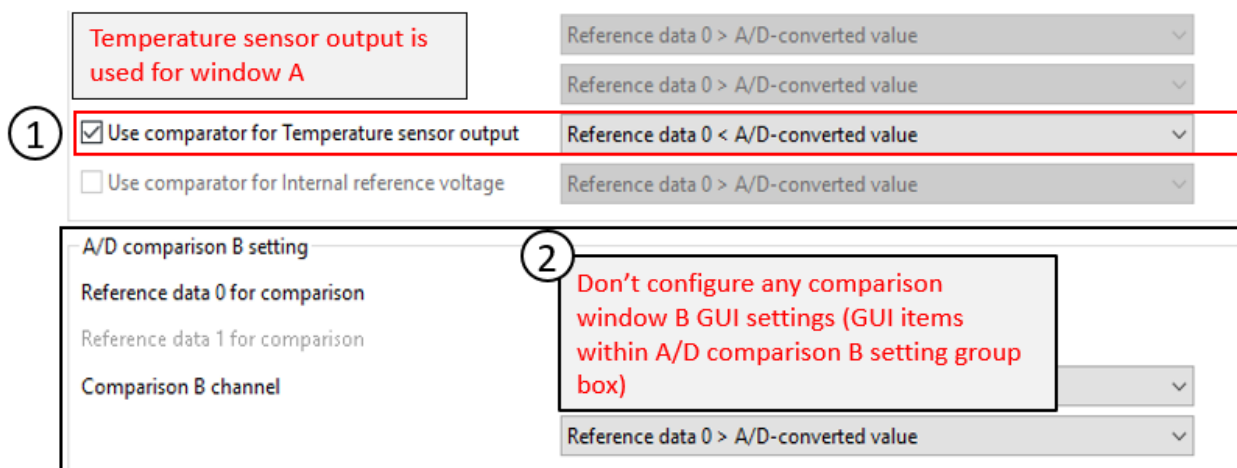


Figure 1.6 Workaround when Temperature sensor output is used for comparison window A

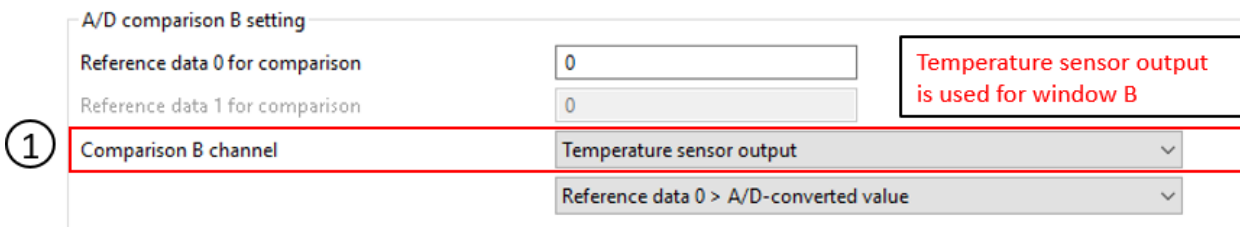
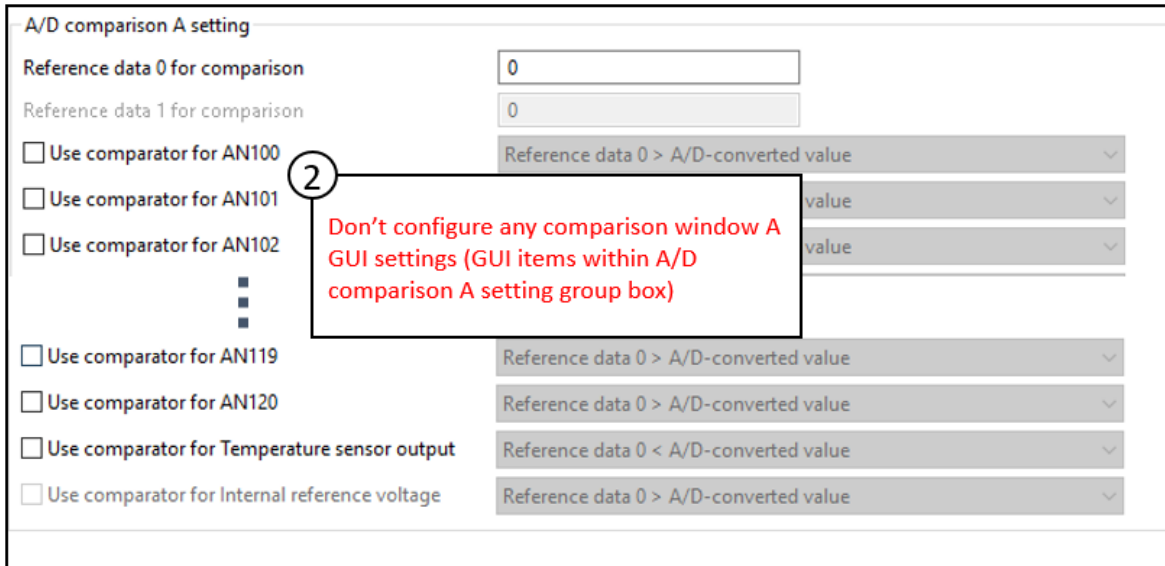


Figure 1.7 Workaround when Temperature sensor output is used for comparison window B

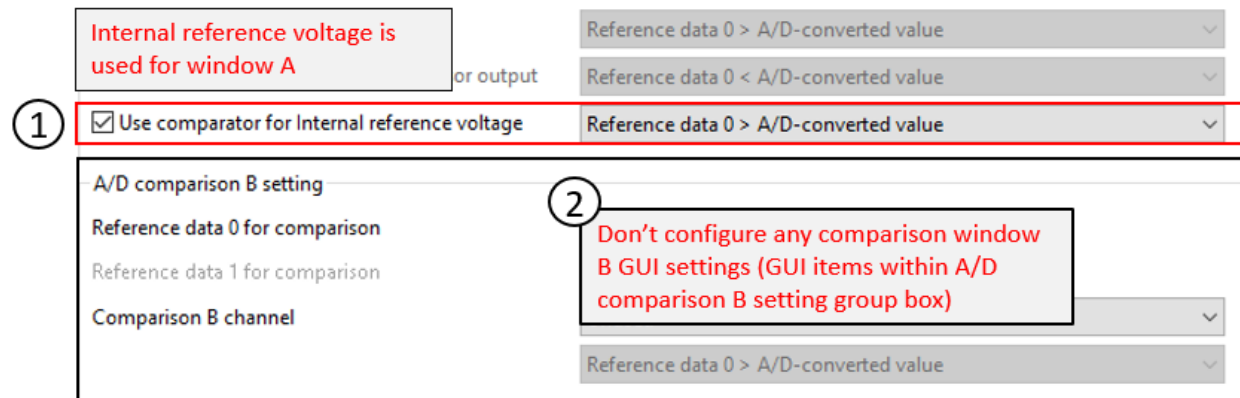


Figure 1.8 Workaround when Internal reference voltage is used for comparison window A

**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

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: 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.

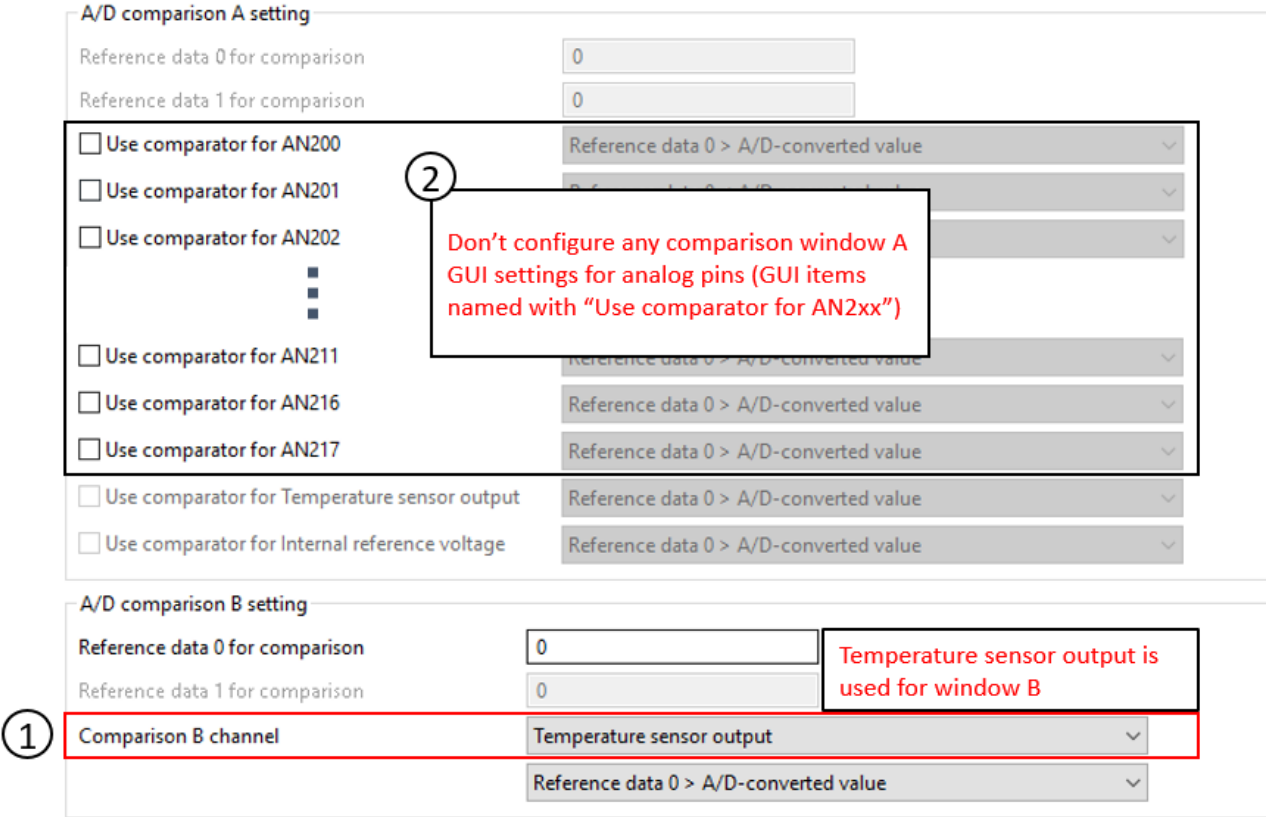


Figure 1.10 Workaround when Temperature sensor output is used for comparison window B

**A/D comparison A setting**

Reference data 0 for comparison	0
Reference data 1 for comparison	0
<input type="checkbox"/> Use comparator for AN200	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for AN201	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for AN202	Reference data 0 > A/D-converted value
⋮	
<input type="checkbox"/> Use comparator for AN211	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for AN216	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for AN217	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for Temperature sensor output	Reference data 0 > A/D-converted value
<input type="checkbox"/> Use comparator for Internal reference voltage	Reference data 0 > A/D-converted value

**A/D comparison B setting**

Reference data 0 for comparison	0	Internal reference voltage is used for window B
Reference data 1 for comparison	0	
<input type="checkbox"/> Comparison B channel	Internal reference voltage	
	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")

①

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.

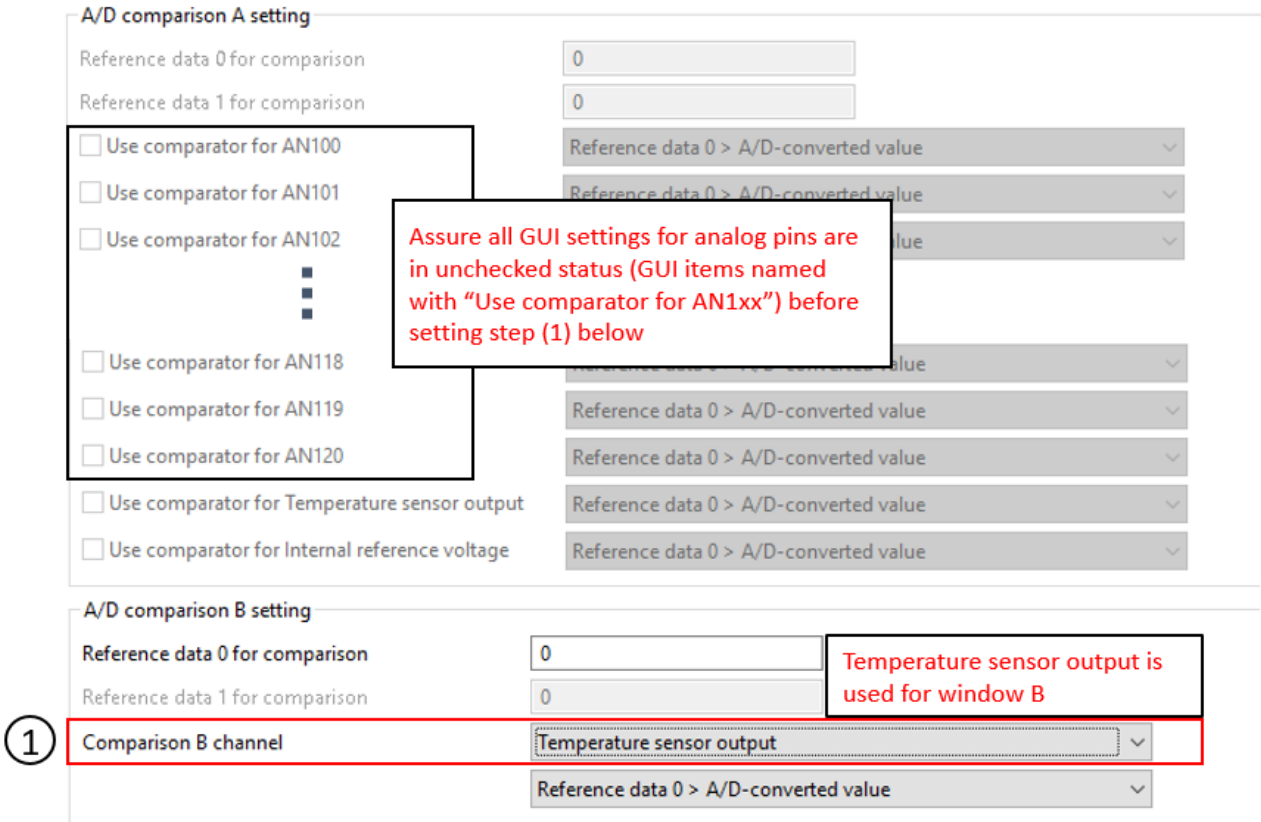
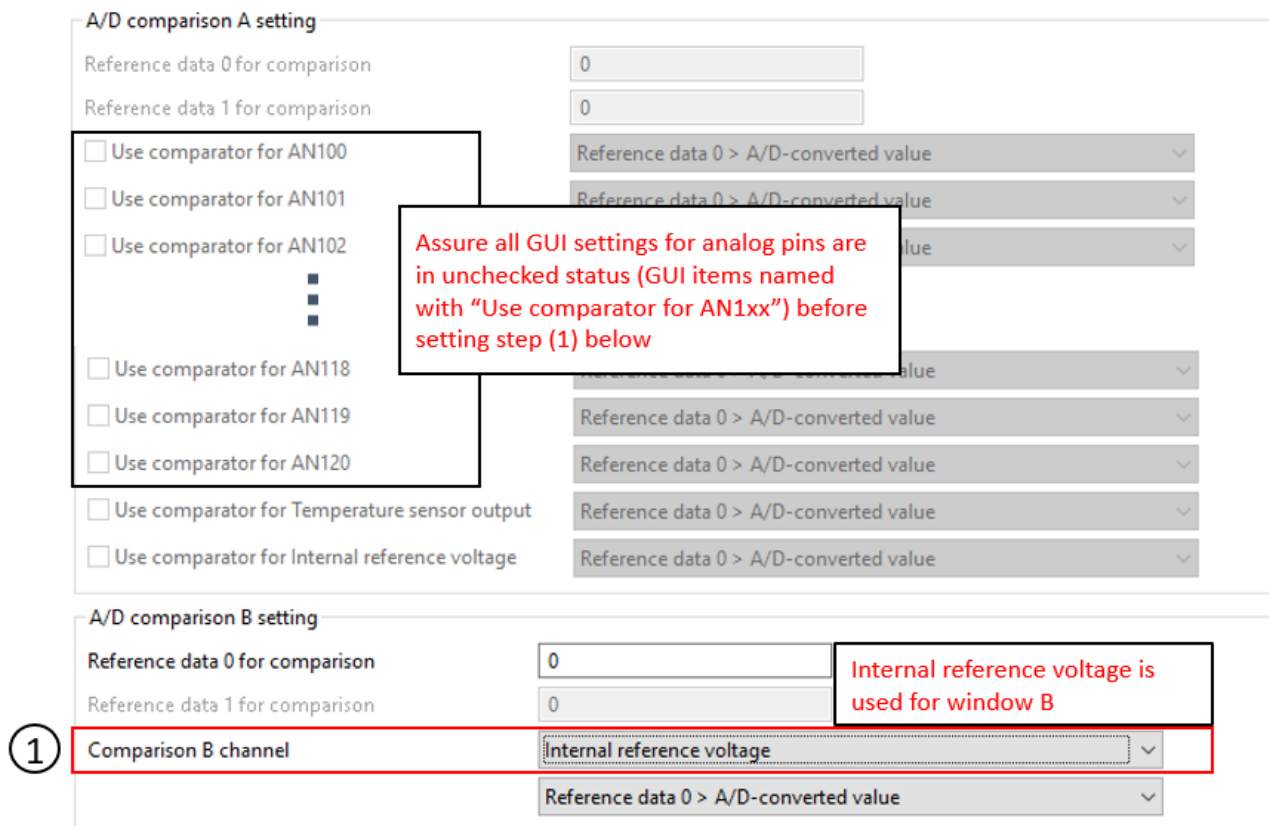


Figure 1.12 Workaround when Temperature sensor output is used for comparison B



**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 / e<sup>2</sup> 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

- e<sup>2</sup> 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 */
    }

    .....
}

```



## 2.5 Schedule for Fixing the Problem

This problem will be fixed in the Smart Configurator for RX V2.4.0 / e<sup>2</sup> 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

- e<sup>2</sup> 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

**Callouts:**

- ③ Select a different conversion resolution (e.g. 10-bit accuracy)
- ①
- ②
- 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 / e<sup>2</sup> 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

- e<sup>2</sup> studio V5.2.0 (Smart Configurator Plug-in V1.0.0) or later
- Smart Configurator for RX V1.0.0 or later

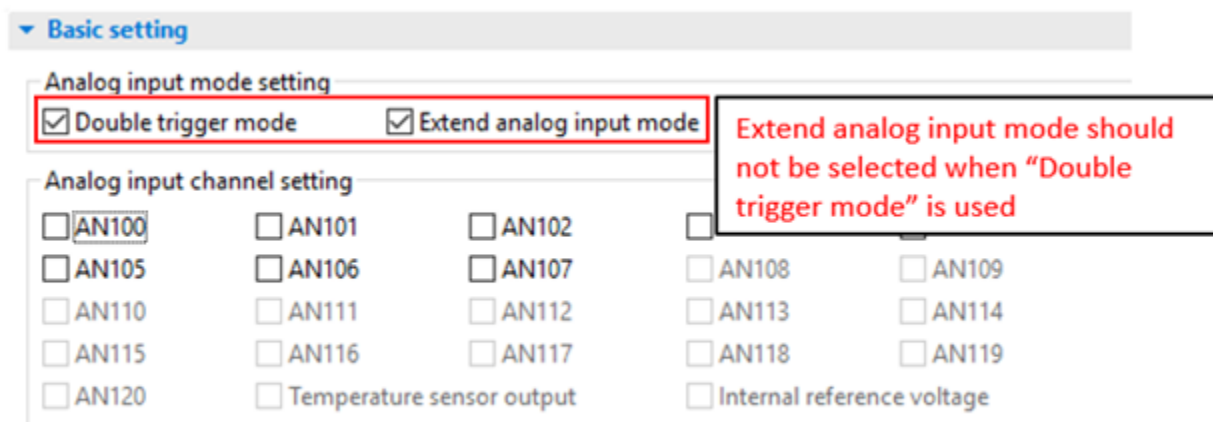
##### 4.2 Applicable Devices

- 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 / e<sup>2</sup> studio V7.7.0 (Scheduled to be released in January 2020.)

Revision History

Rev.	Date	Description	
		Page	Summary
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