

Application Note

ADC_Monitor

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1. Preface

This application note describes sample software for the analog-to-digital converter (ADC) monitoring function.

This document helps the user check operation of a product under development and develop its program.

2. Technical Term

| Term/Abbreviation | Definition |
|-------------------|---|
| ADC | Analog to Digital Converter |
| BSP | Board Support Package |
| CG | Clock Control and Operation Mode |
| Timer | T32A:32-bit Timer Event Counter |
| UART | Universal Asynchronous Receiver Transmitter |

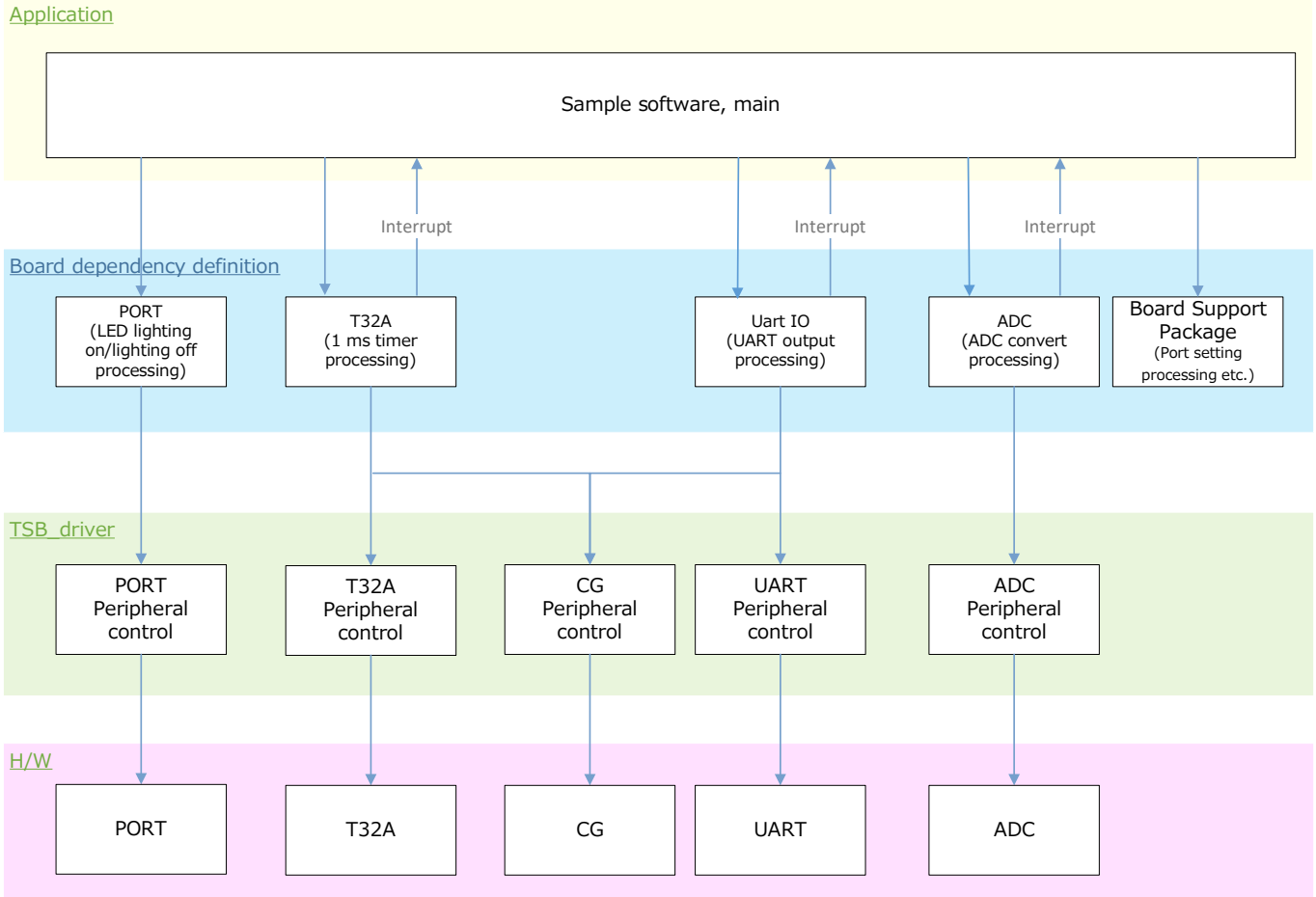
3. Reference Document

| Document | Notes |
|------------------------------------|--|
| Data sheet | Refer to the data sheet of MCU to be used. |
| Reference manual | Refer to the reference manual of each IP to be used. |
| Application note MCU User Guide | Refer to the MCU user guide to be used. |

4. Target Sample Program

| Sample Program | Outline |
|----------------|---|
| ADC_Monitor | Sample program of ADC monitoring function |

5. Configuration Diagram



6. Sample Program:ADC_Monitor

This is sample software that changes the LED display pattern according to variable resistance value changes using the ADC monitoring function.

6.1. Outlines of Operation

Measure the output voltage of BSP_VR_1 with ADC.

When the acquired value is less than or equal to CMPValueA, BSP_LED_1 and BSP_LED_2 are turned off.

If the obtained reading is CMPValueA large and lower than CMPValueB, BSP_LED_1 turns off and BSP_LED_2 turns on.

If the acquired value is equal to or greater than CMPValueB, BSP_LED_1 and BSP_LED_2 are turns on.

For the values of CMPValueA and B, please refer to 6.4. Configuration.

6.2. Function to Use

The functions to use are as follows:

For the Port assignment of each BSP channel, refer to the MCU user guide.

| IP | Channel | Objective |
|---------------|------------------|-------------------------------------|
| ADC | BSP_VR_1 | Variable resistance value |
| PORT (LED) | BSP_LED_1 | For operation check |
| | BSP_LED_2 | For operation check |
| UART | BSP_UART_1 | For terminal emulator communication |
| T32A | BSP_T32A_TIMER_1 | interval timer |

6.3. Interrupt to Use

| Interrupt | Outlines |
|-----------|---|
| (Note1) | UART Transmission interrupt for terminal emulator |
| (Note2) | UART Error interrupt for terminal emulator |
| (Note3) | T32A Timer A Timer counter increment every 1ms |
| INTADACP0 | ADC monitor for variable resistance value For information monitoring |
| INTADACP1 | ADC monitor for variable resistance value For information monitoring |

Note1: For SBK-M471, "INTSC0TX".

Note2: For SBK-M471, "INTSC0ERR".

Note3: For SBK-M471, "INTT32A00AC".

6.4. Configuration

"main.c" configuration setting.

| Configuration | Soft Definition Name | Current Value(Defaults) | Description |
|---------------|----------------------|-------------------------|--|
| Timer A | CFG_OUTPUT_INTERVAL | 5000 | Output Log_1 output interval (Unit: ms) |
| CMPValueA | CFG_ADC_CMP_VALUE_A | 0x555 | - |
| CMPValueB | CFG_ADC_CMP_VALUE_B | 0xAAA | - |

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation



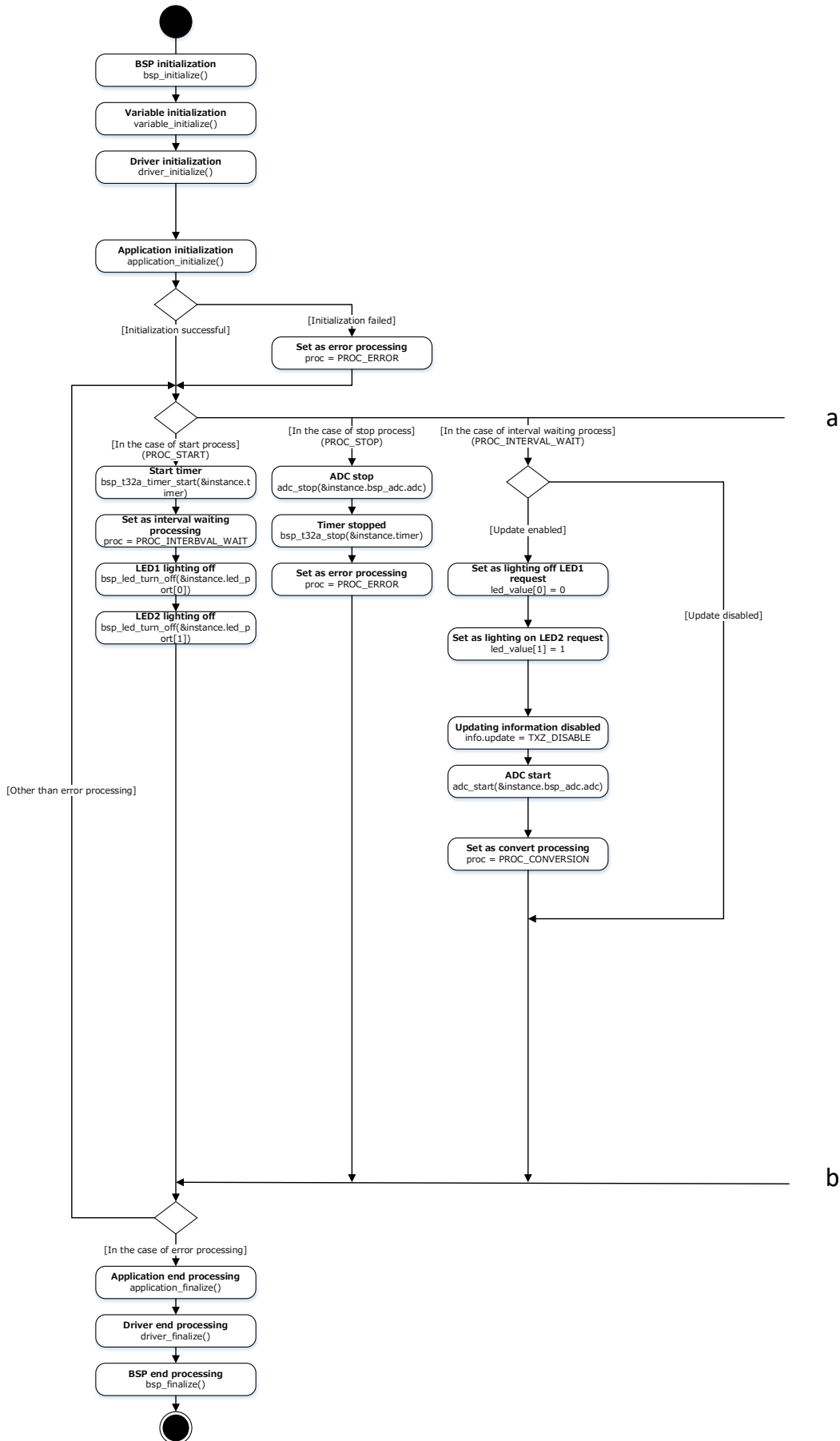
Convert Result Value [VR1]:0x128

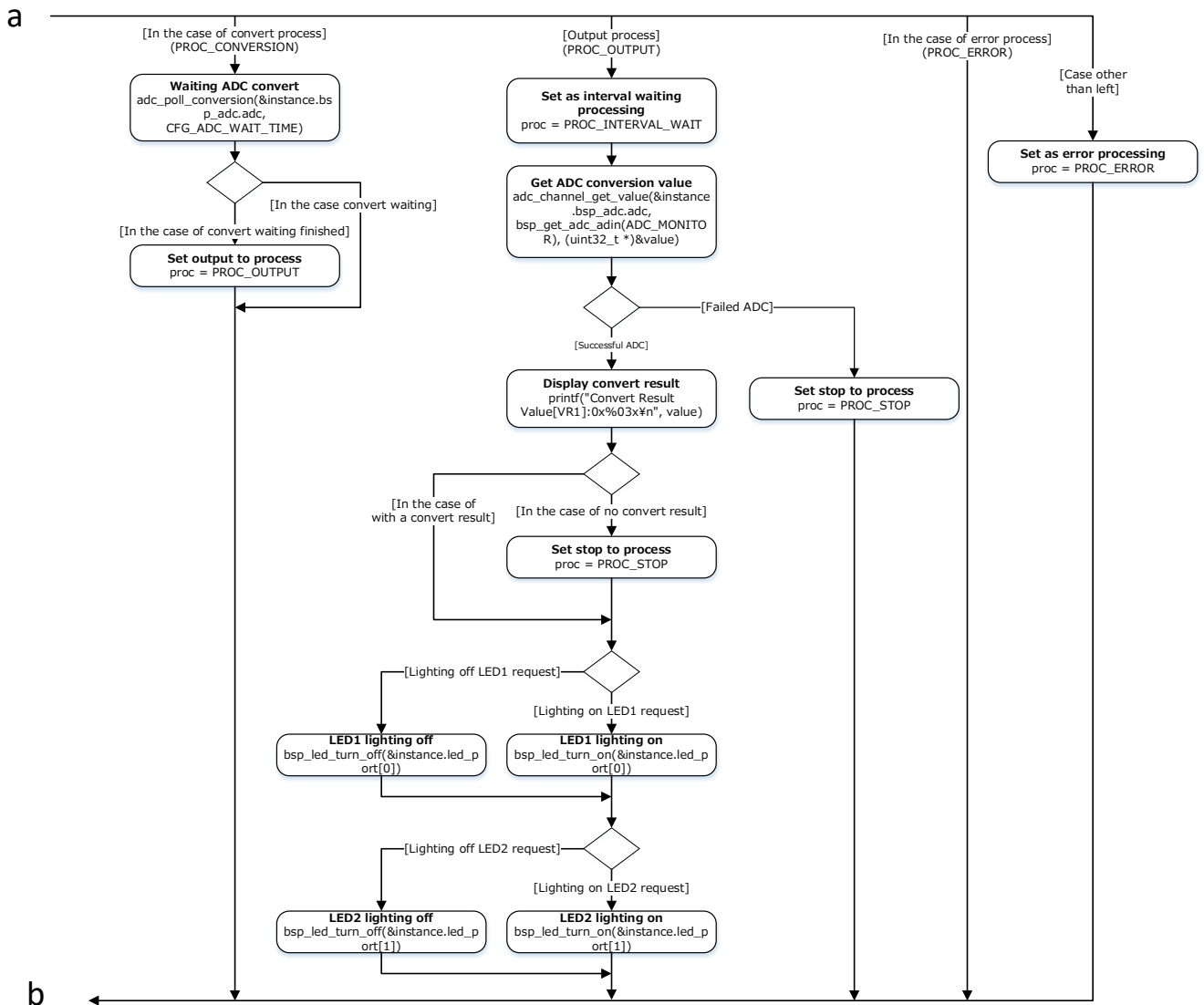
6.5.2. Case of Error Occurrence

Nothing.

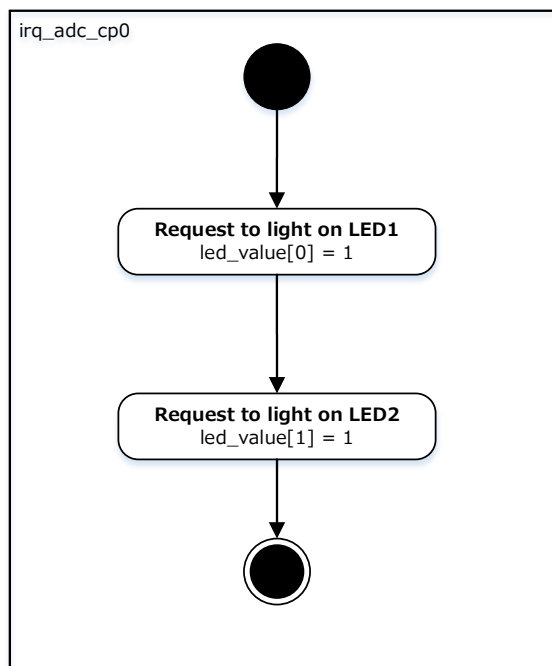
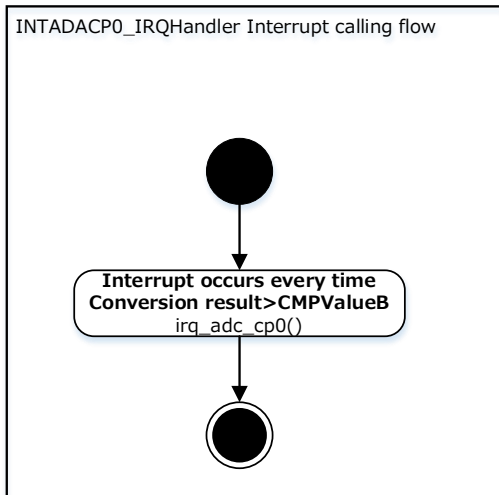
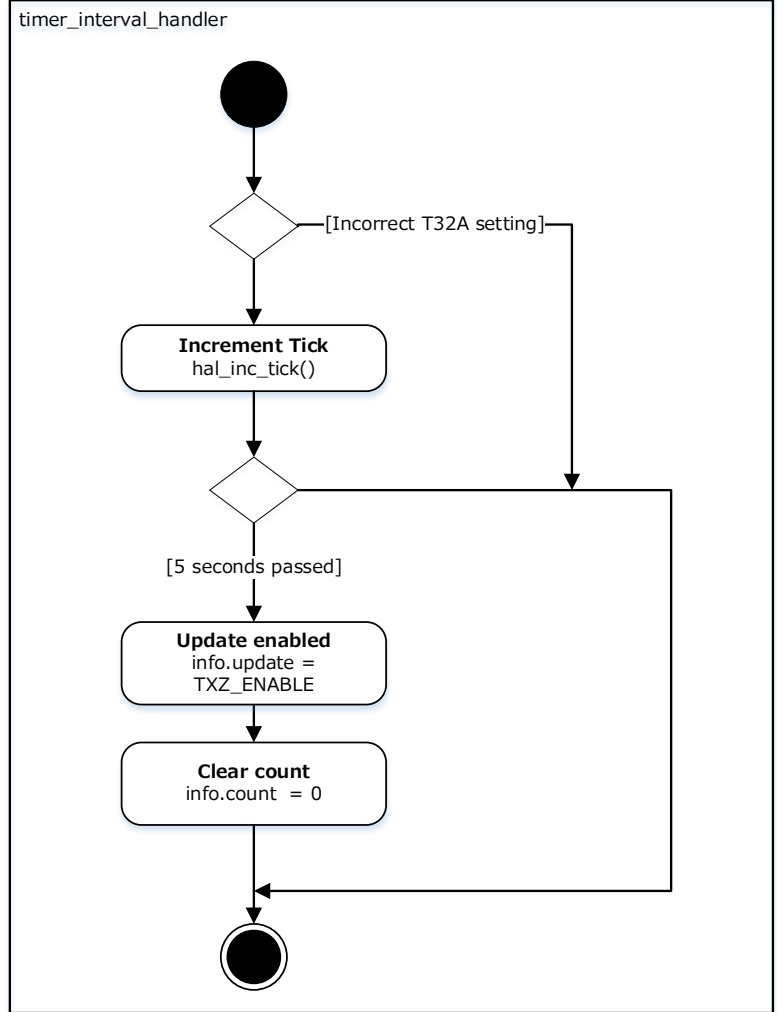
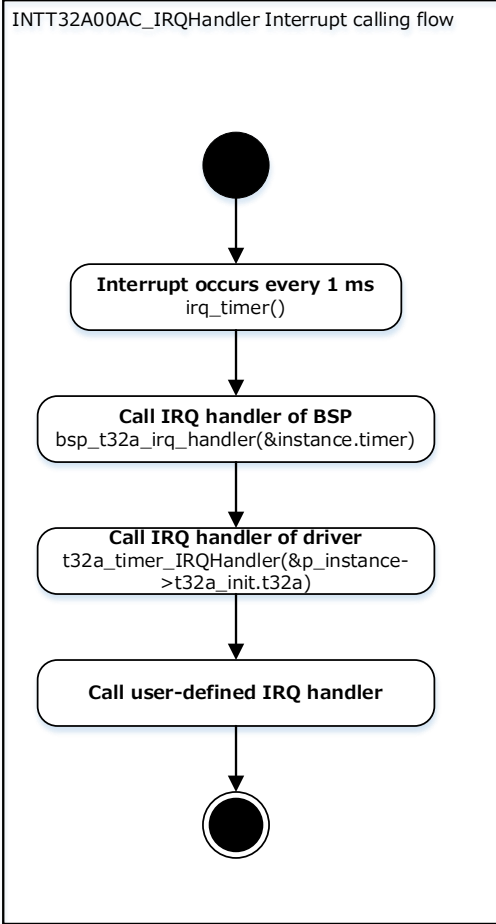
7. Activity diagram

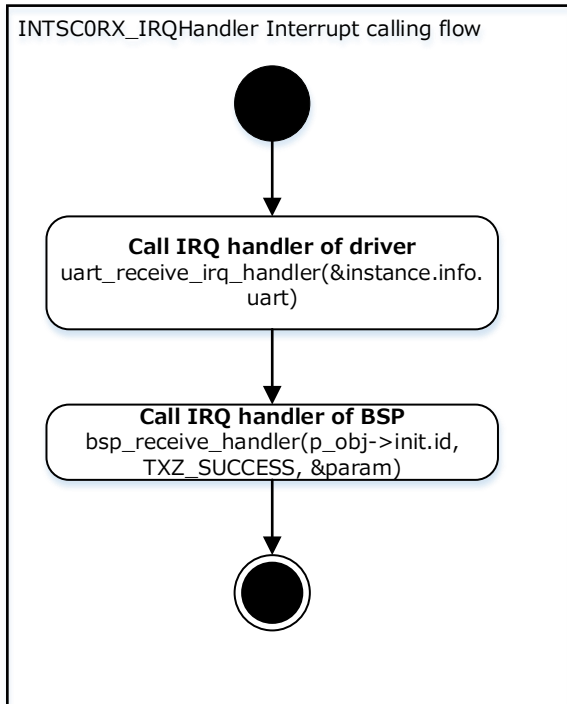
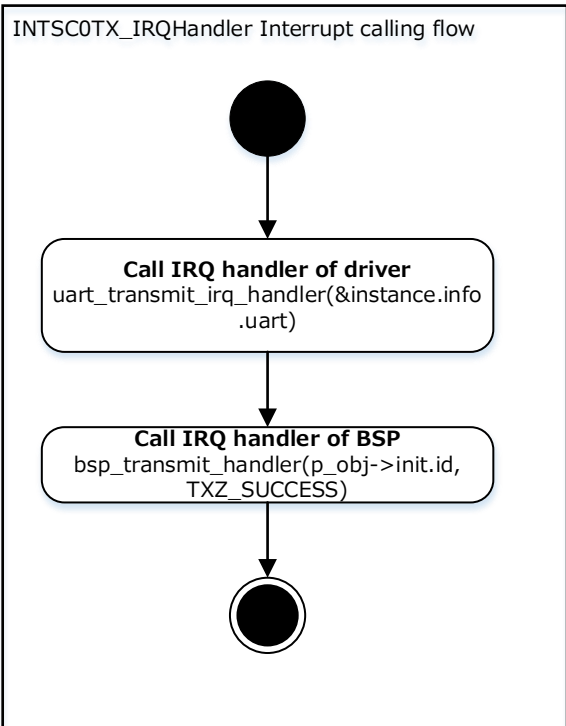
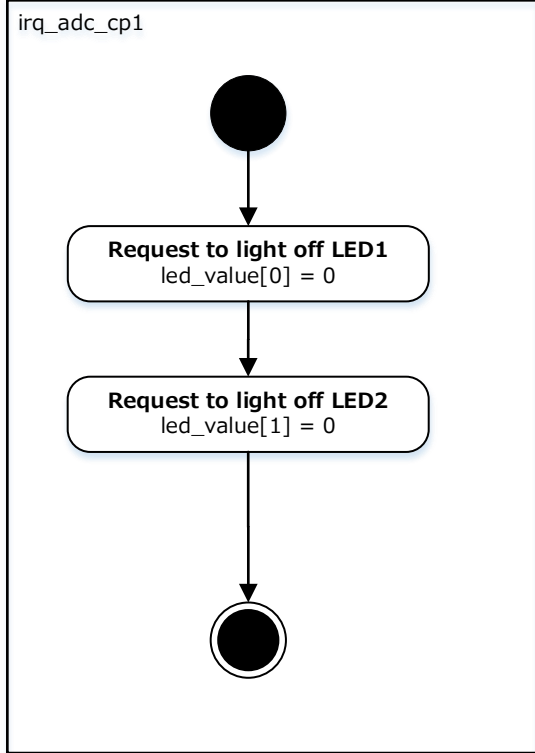
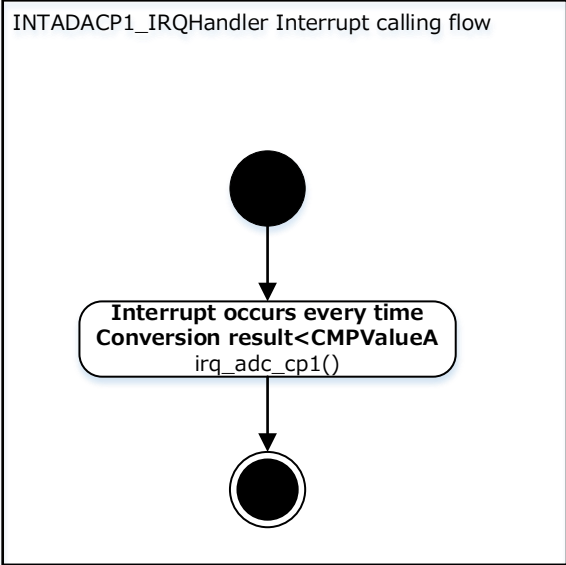
7.1. main

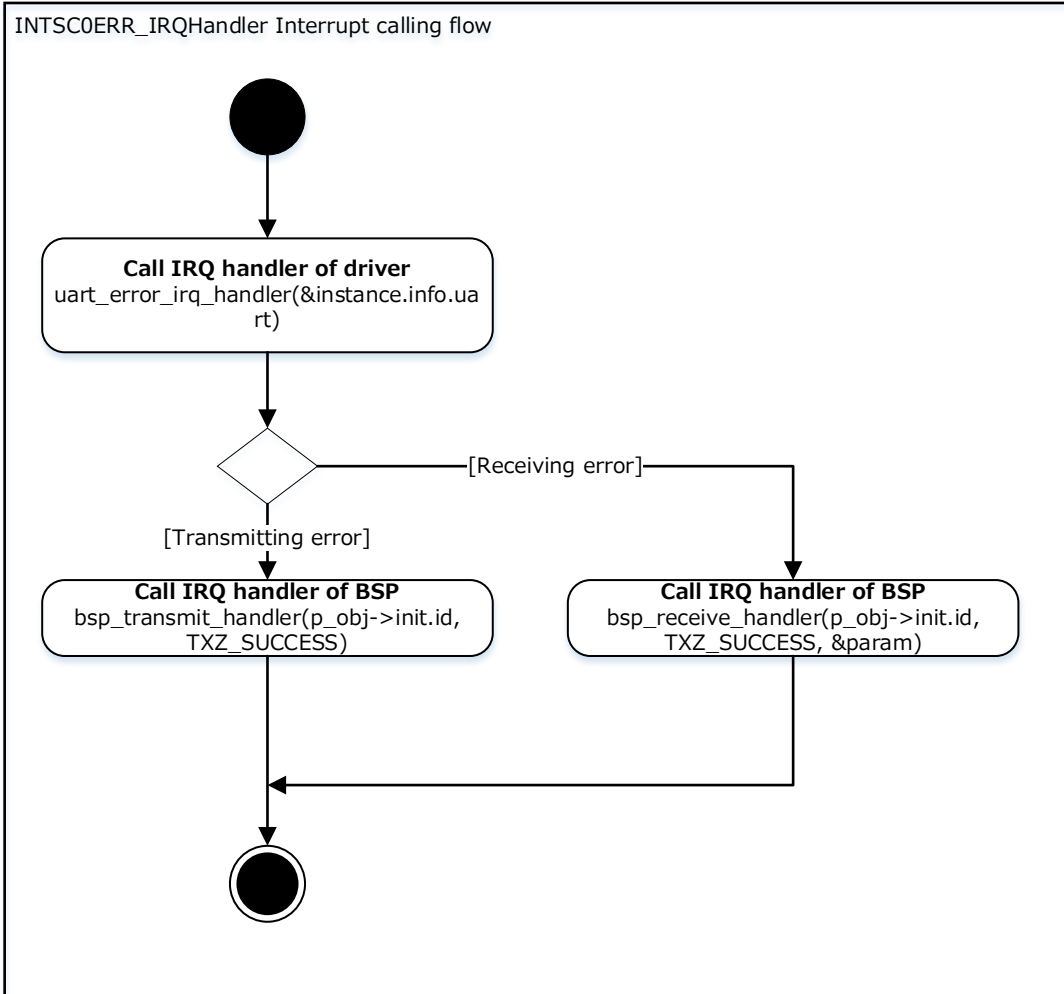




7.2. Interrupt







8. Revision History

| Revision | Date | Description |
|----------|------------|---------------|
| 1.0 | 2025-01-20 | First release |

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