

Application Note

ADC Monitor

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1. Preface

This application note describes sample software Adc_Monitor that uses the 12bit analog-to-digital converter (ADC).

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

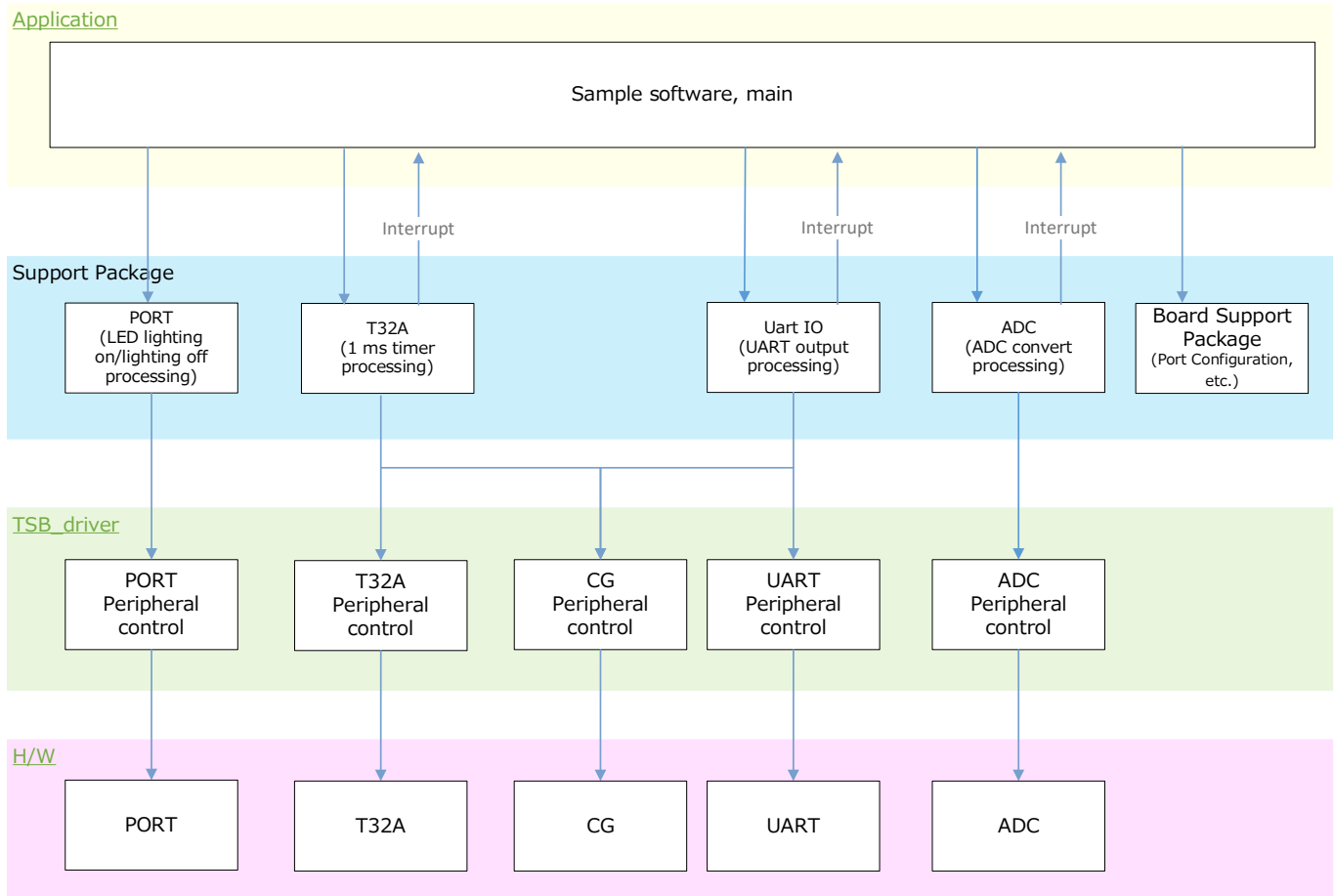
3. Reference Document

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.
Driver API List	Refer to the Doc folder.

4. Target Sample Program

Sample Program	Outline
ADC_Monitor	Sample Program for AD Conversion Monitoring Function

5. Configuration Diagram



6. Sample Program: ADC_Monitor

This sample program demonstrates how to use the ADC monitoring function to change LED display patterns based on changes in the potentiometer value.

6.1. Outlines of Operation

The output voltage of BSP_VR_1 is measured by the ADC.

When the acquired value is lower than CMPValueA, both BSP_LED_1 and BSP_LED_2 are turned off.

When the acquired value is equal to or greater than CMPValueA and lower than CMPValueB, BSP_LED_1 is turned off and BSP_LED_2 is turned on.

When the acquired value is equal to or greater than CMPValueB, both BSP_LED_1 and BSP_LED_2 are turned on.

For the values of CMPValueA and CMPValueB, refer to Section 6.4, Configuration.

BSP_VR_1 Conversion Value	BSP_LED_1	BSP_LED_2	Explanation
BSP_VR_1 < CMPValueA	light off	light off	-
CMPValueA ≤ BSP_VR_1 < CMPValueB	light off	light on	-
CMPValueB ≤ BSP_VR_1	light on	light on	-

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	For Potentiometer
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	As a 1ms interval timer

6.3. Interrupt to Use

For details, please refer to the “Interrupt List by Sample” in the MCU User’s Manual.

6.4. Configuration

Configuration setting.

Configuration	Soft Definition Name	Current Value (Defaults)	Description
Timer A	CFG_OUTPUT_INTERVAL	5000	Output Log_1 Interval (Unit: ms)
CMPValueA	CFG_ADC_CMP_VALUE_A	0x555	Potentiometer Value Threshold A
CMPValueB	CFG_ADC_CMP_VALUE_B	0xAAA	Potentiometer Value Threshold B

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

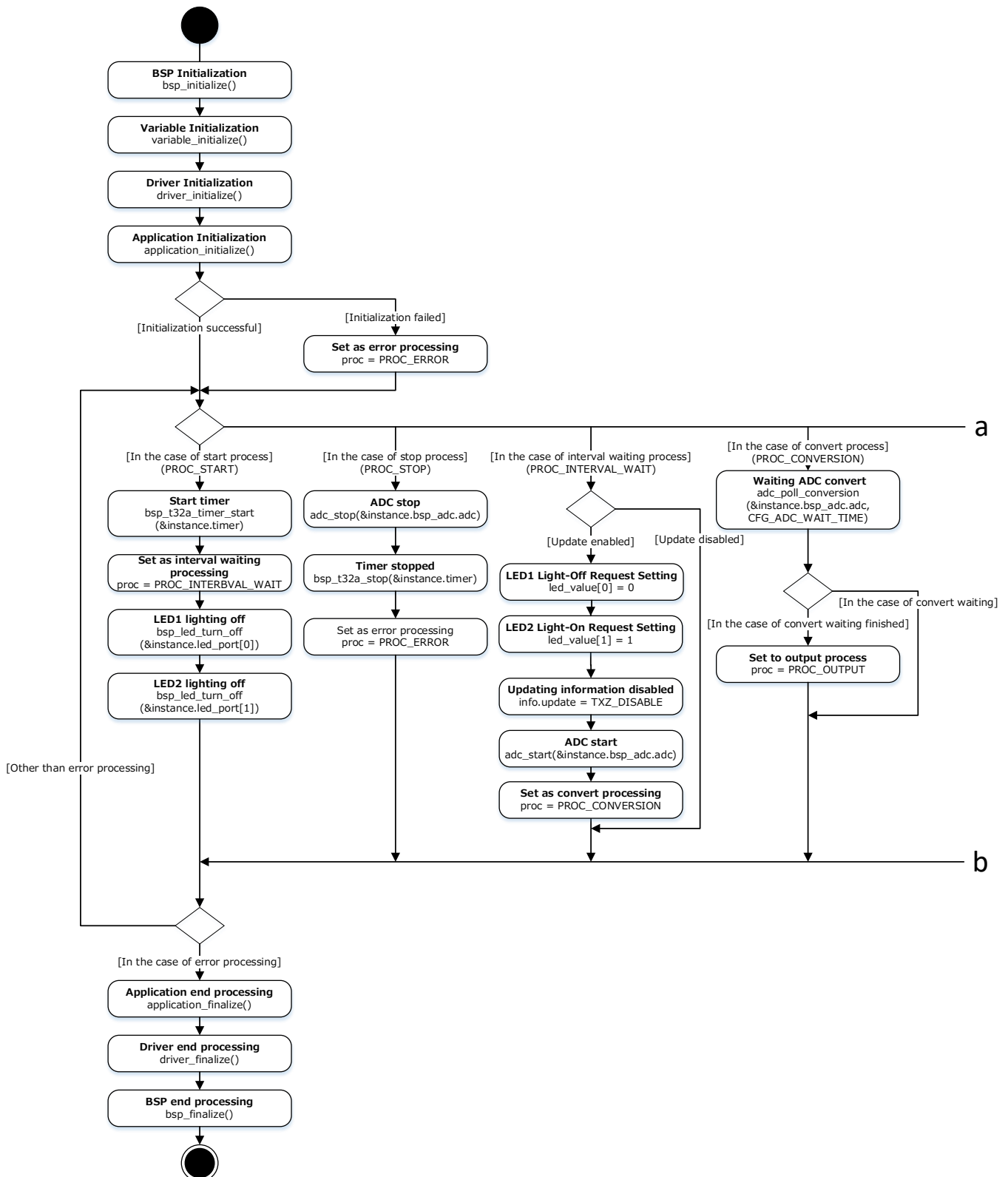
Convert Result Value [VR1]:0x128

6.5.2. Case of Error Occurrence

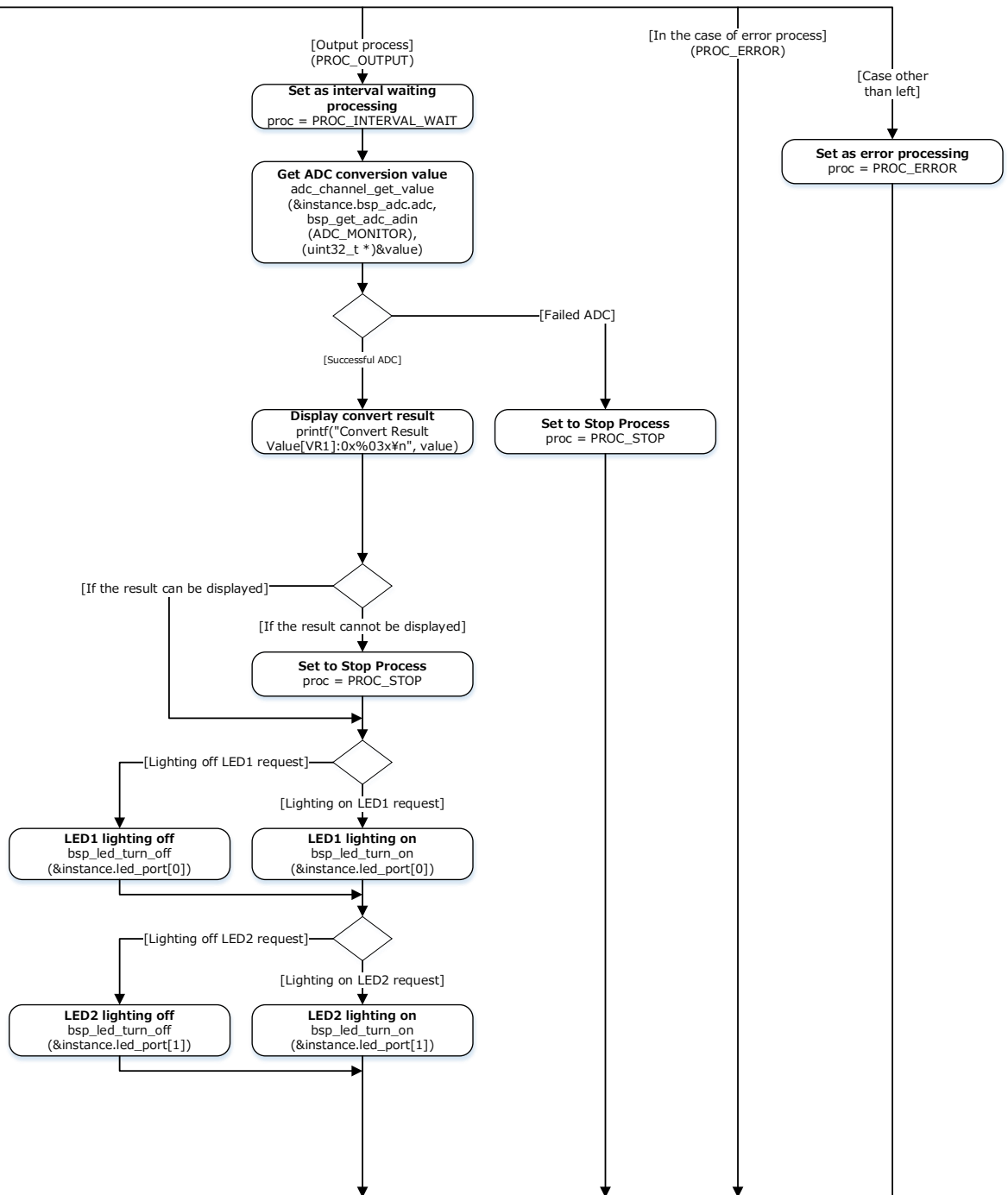
Nothing.

7. Activity diagram

7.1. main



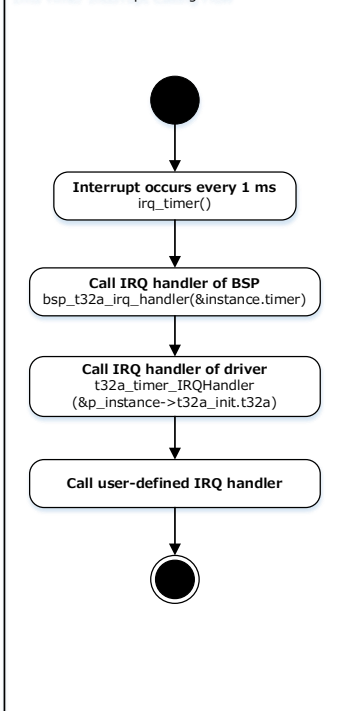
a



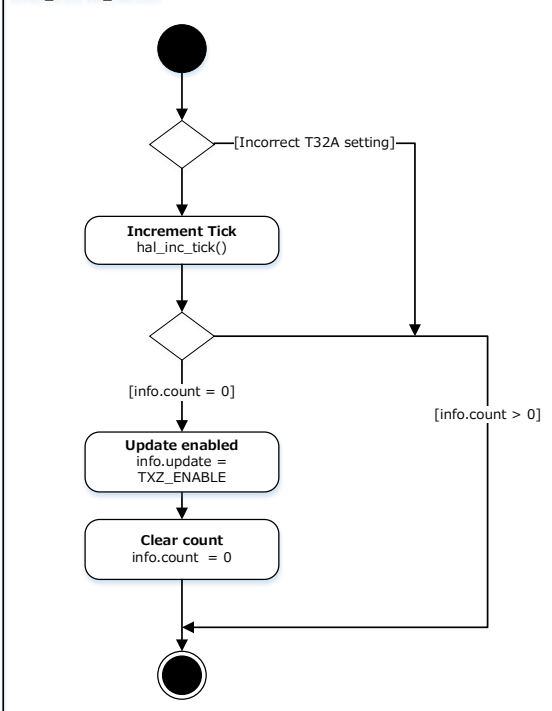
b

7.2. Interrupt

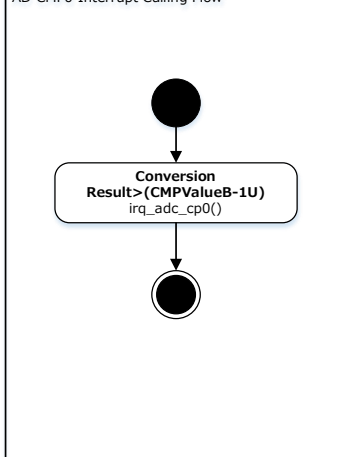
1ms Timer Interrupt Calling Flow



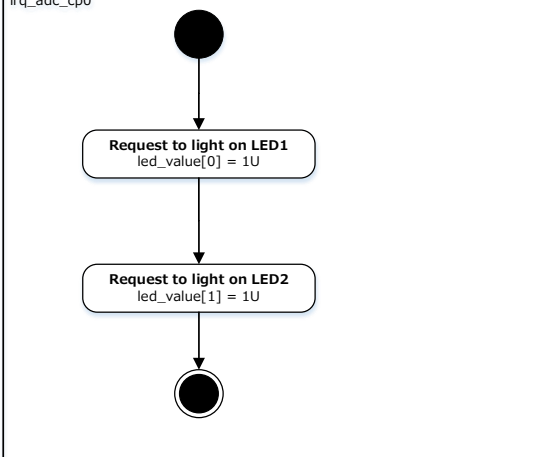
timer_interval_handler



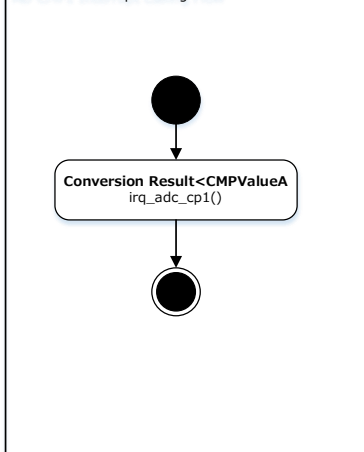
AD CMP0 Interrupt Calling Flow



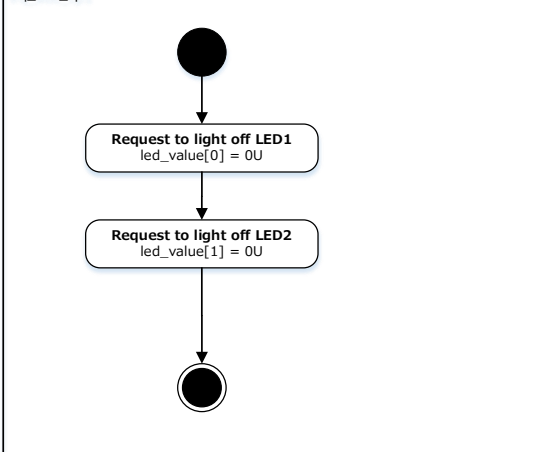
irq_adc_cp0



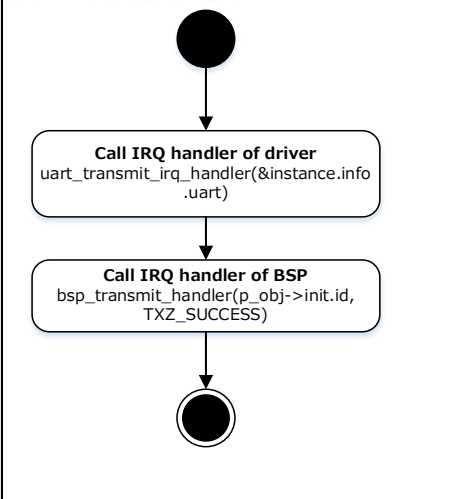
AD CMP1 Interrupt Calling Flow



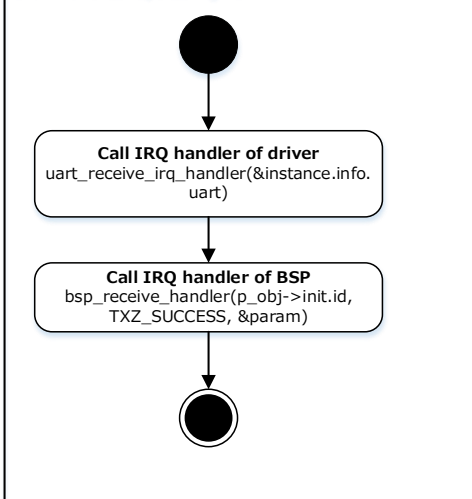
irq_adc_cp1



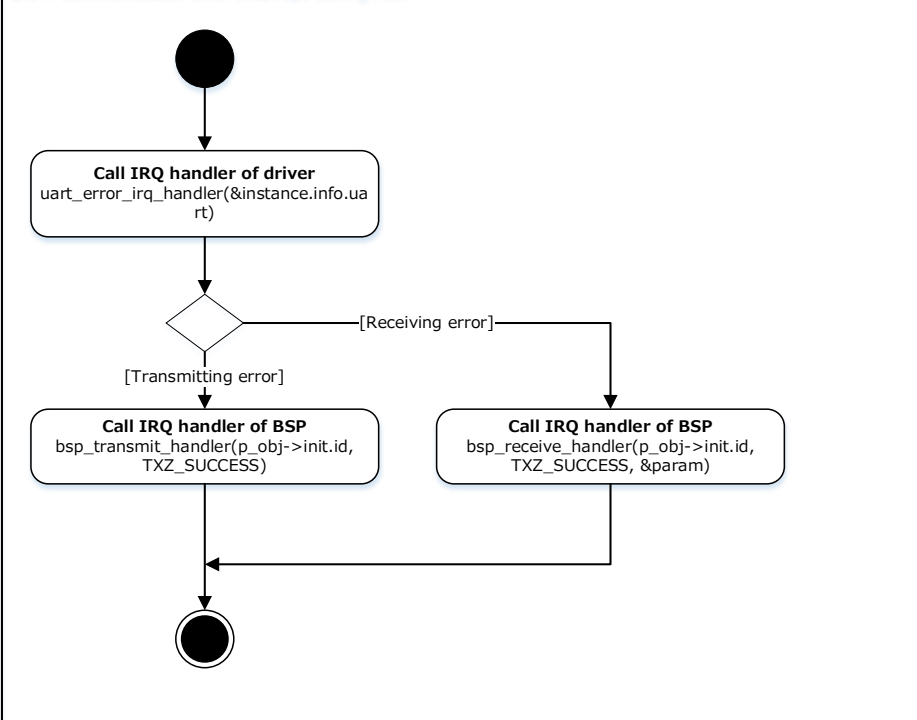
UART TX Interrupt calling flow



UART RX Interrupt calling flow



UART Communication Error Interrupt Calling Flow



8. Revision History

Revision	Date	Description
1.0	2025-01-20	First release
1.1	2026-07-30	6.3 Interrupt to Use Detailed information is transcribed into the User's Manual

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