

Application Note

FLASH_Code

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1. Preface

This application note describes sample software FLASH_Code that uses FLASH Memory (FLASH).
This document helps the user check operation of a product under development and develop its program.

2. Technical Term

Term/Abbreviation	Definition
BSP	Board Support Package
CG	Clock Control and Operation Mode
FLASH	Flash Memory
Timer	T32A:32-bit Timer Event Counter
UART	Universal Asynchronous Receiver Transmitter

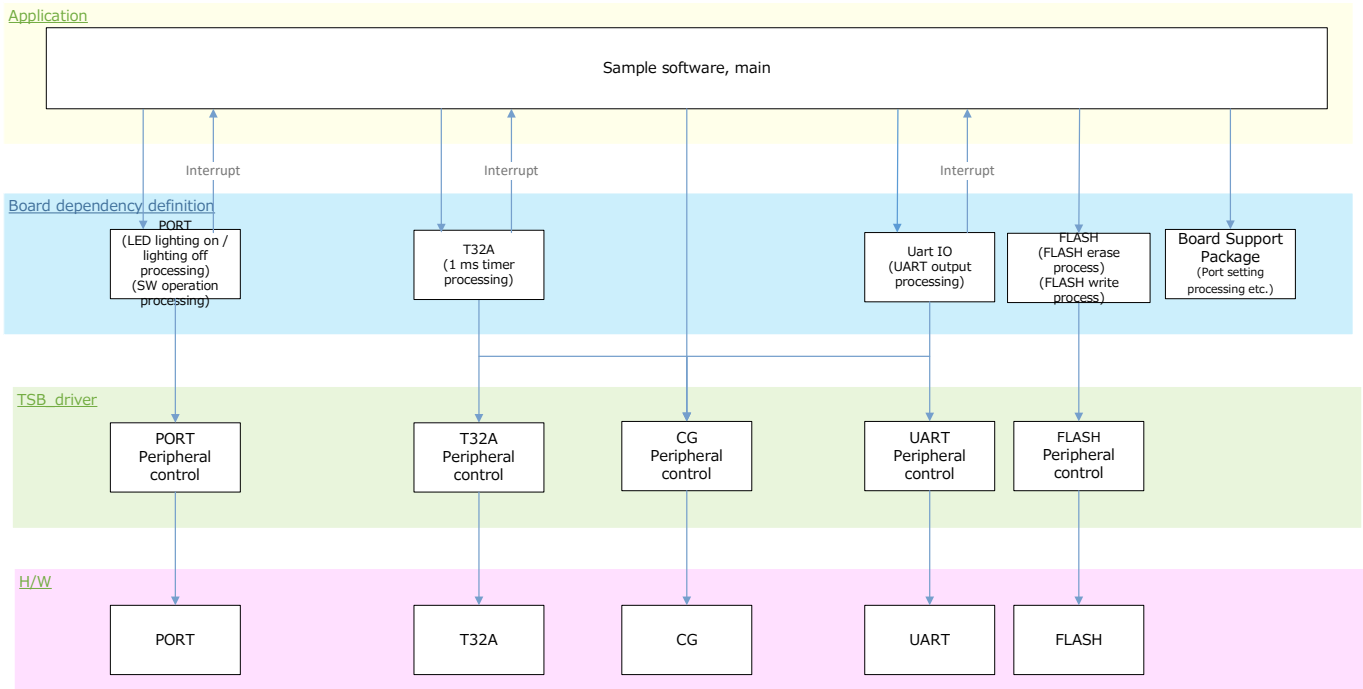
3. Reference Document

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
FLASH_Code	Sample program of FLASH_Code function

5. Configuration Diagram



6. Sample Program: FLASH_Code

This is sample software that swaps CODE_area_A and CODE_area_B each time BSP_PSW_1 is pressed and executes CODE_area_A.

6.1. Outlines of Operation

Execute the processing of CODE area A.

- (1) When BSP_PSW_1 is pressed, BSP_LED_1 and BSP_LED_3 blink at a 1 second cycle, and BSP_LED_2 and BSP_LED_4 will turn off.
- (2) Save CODE area A to RAM_A and CODE area B to RAM_B, and erase the data in the CODE area.
- (3) Write the contents of RAM_B to CODE area A and the contents of RAM_A to CODE area B.
- (4) The processing of CODE area B is executed, turn off BSP_LED_1 and BSP_LED_3, and blinking BSP_LED_2 and BSP_LED_4 at a 1-second cycle.

Since writing occurs in 128-byte units, if the specified size is less than 128 bytes, undefined data will be written.

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
PORT (Push-Switch)	BSP_PSW_1	Event trigger
T32A	BSP_T32A_TIMER_1	Interval timer
PORT (LED)	BSP_LED_1	For operation check
	BSP_LED_2	For operation check
	BSP_LED_3	For operation check
	BSP_LED_4	For operation check
UART	BSP_UART_1	For terminal emulator communication (Outputs log)

6.3. Interrupt to Use

Interrupt	Outlines
(Note1)	UART Transmission interrupt
(Note2)	UART Error interrupt
(Note3)	T32A Timer A Timer counter increment every 1ms

Note1: For SBK-M471, "INTSC0TX".

For AdBun-M3HQA, "INTUART0TX".

Note2: For SBK-M471, "INTSC0ERR".

For AdBun-M3HQA, "INTUART0ERR".

Note3: For SBK-M471 and AdBun-M3HQA, "INTT32A00AC".

6.4. Configuration

Configuration setting.

Configuration	Soft Definition Name	Current Value (Defaults)	Description
CODE_area_A	FLASH_DEMO_A	Code Flash Block1 (For M471 and M3H, FC_CODE_FLASH_PAGE8)	Initially place the blinking process for BSP_LED_1 and BSP_LED_3
CODE_area_B	FLASH_DEMO_B	Code Flash Block2 (For M471 and M3H, FC_CODE_FLASH_PAGE16)	Initially place the blinking process for BSP_LED_2 and BSP_LED_4
CODE_area_size	data_a[0xXXXX] data_b[0xXXXX]	For M471 and M3H, 0x1000	Code Flash size used (allocated) for processing CODE areas A and B
	__size_demoA__ __size_demoB__	For M471 and M3H, 0x1000	
RAM_A	RAM_DEMO_A	0x20002000 (Only M471 KEIL, 0x20001000)	Backup RAM for CODE area A
RAM_B	RAM_DEMO_B	0x20003000 (Only M471 KEIL, 0x20002000)	Backup RAM for CODE area B
Cycle A	CFG_LED_BLINK_FRQ1	0.5	BSP_LED_1 blinking period Period (Unit: Hz)
Duty A	CFG_LED_BLINK_DUTY1	0.5	BSP_LED_1 blinking period Duty 50%
Cycle B	CFG_LED_BLINK_FRQ2	0.5	BSP_LED_2 blinking period Period (Unit: Hz)
Duty B	CFG_LED_BLINK_DUTY2	0.5	BSP_LED_2 blinking period Duty 50%
Cycle C	CFG_LED_BLINK_FRQ3	0.5	BSP_LED_3 blinking period Period (unit: Hz)
Duty C	CFG_LED_BLINK_DUTY3	0.5	BSP_LED_3 blinking period Duty 50%
Cycle D	CFG_LED_BLINK_FRQ4	0.5	BSP_LED_4 blinking period Period (unit: Hz)
Duty D	CFG_LED_BLINK_DUTY4	0.5	BSP_LED_4 blinking period Duty 50%

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

```
Execute Program A  
Please Press the SW1  
  
RAM transferring.  
Erasing.  
Rewriting.  
Finished.  
Execute Program B  
Please Press the SW1
```

6.5.2. Case of Erasing Error Occurrence

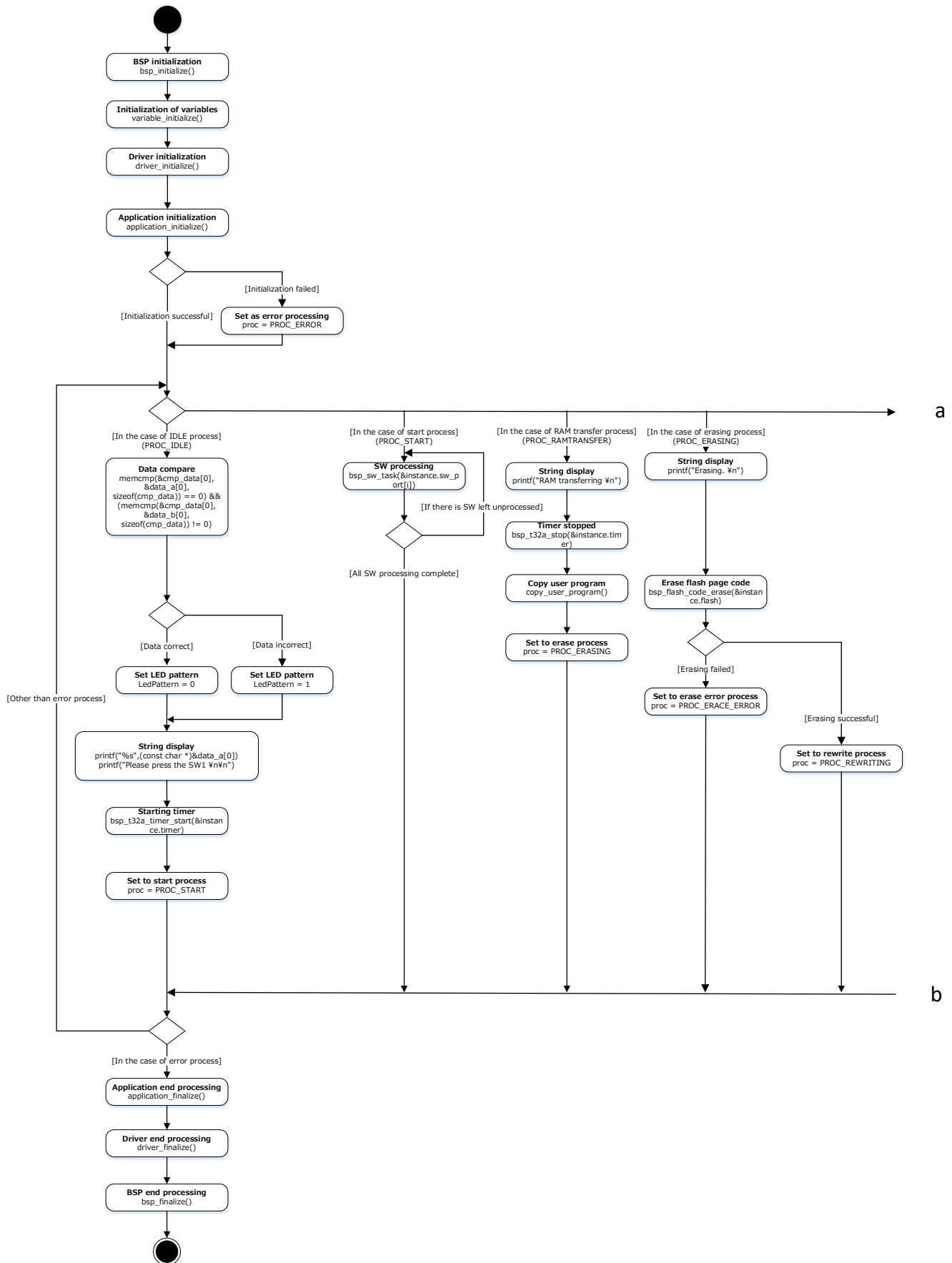
```
Execute Program A  
Please Press the SW1  
  
RAM transferring.  
Erasing.  
Erasing Error!!  
Execute Program A  
Please Press the SW1
```

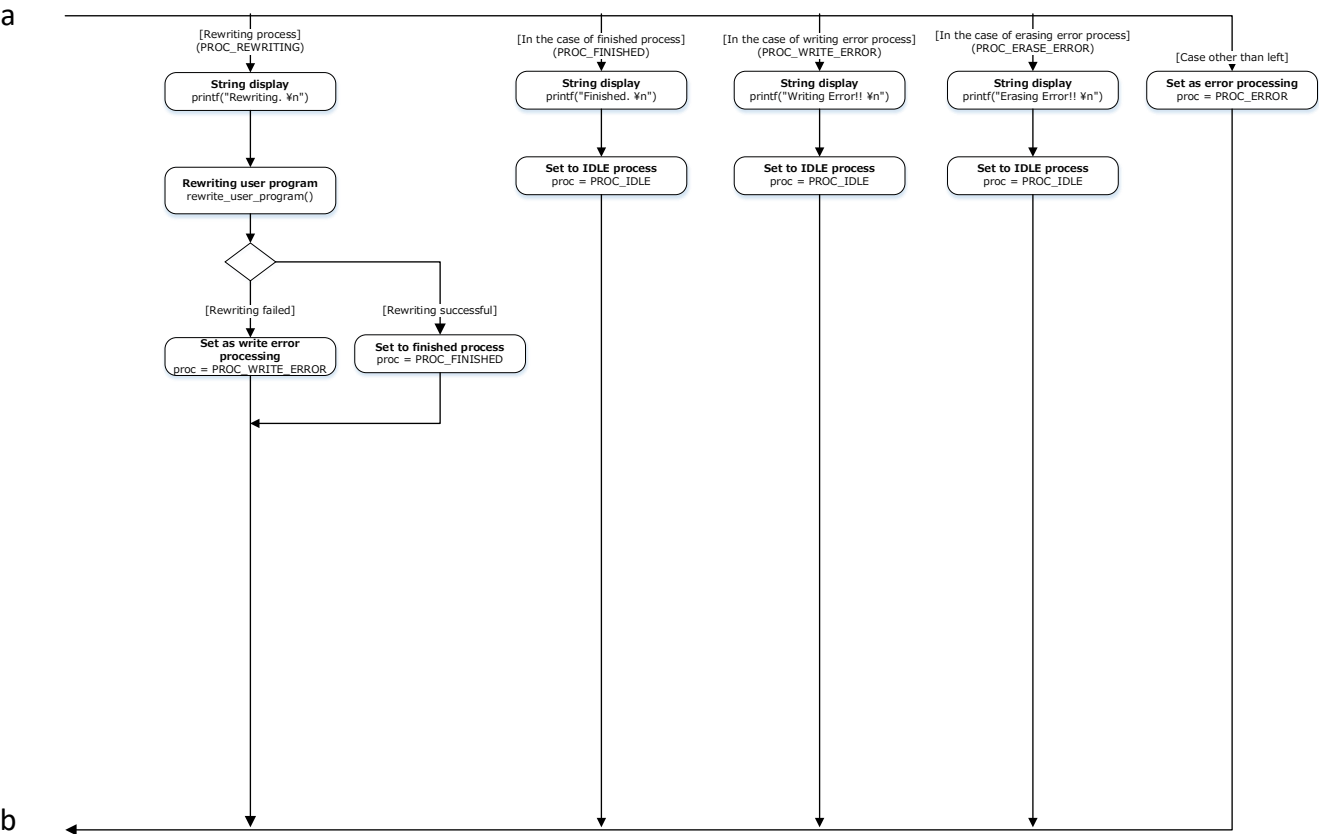
6.5.3. Case of Writing Error Occurrence

```
Execute Program A  
Please Press the SW1  
  
RAM transferring.  
Erasing.  
Rewriting.  
Writing Error!!  
Execute Program A  
Please Press the SW1
```

7. Activity diagram

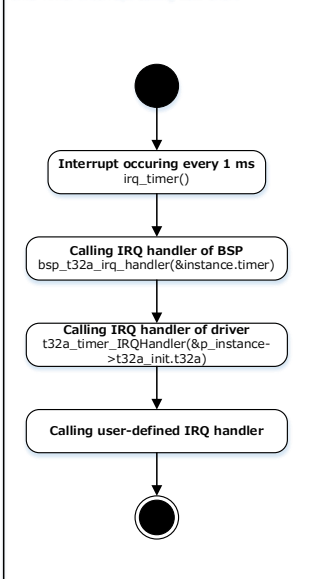
7.1. main



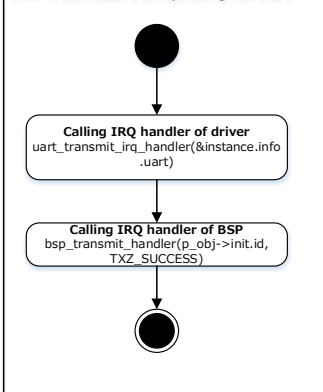


7.2. Interrupt

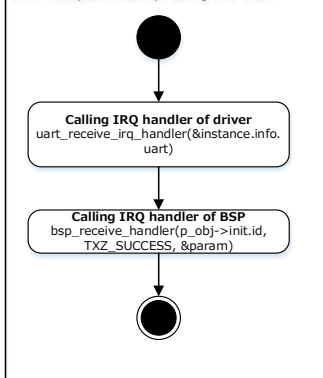
1ms Timer Interrupt calling flow chart



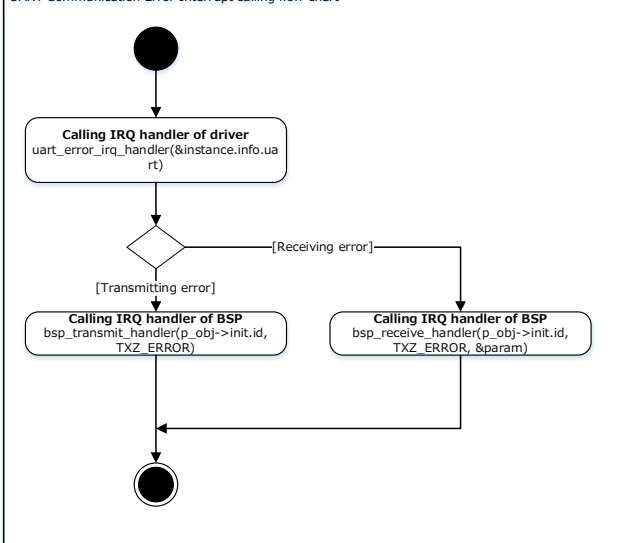
UART Transmission Interrupt calling flow chart

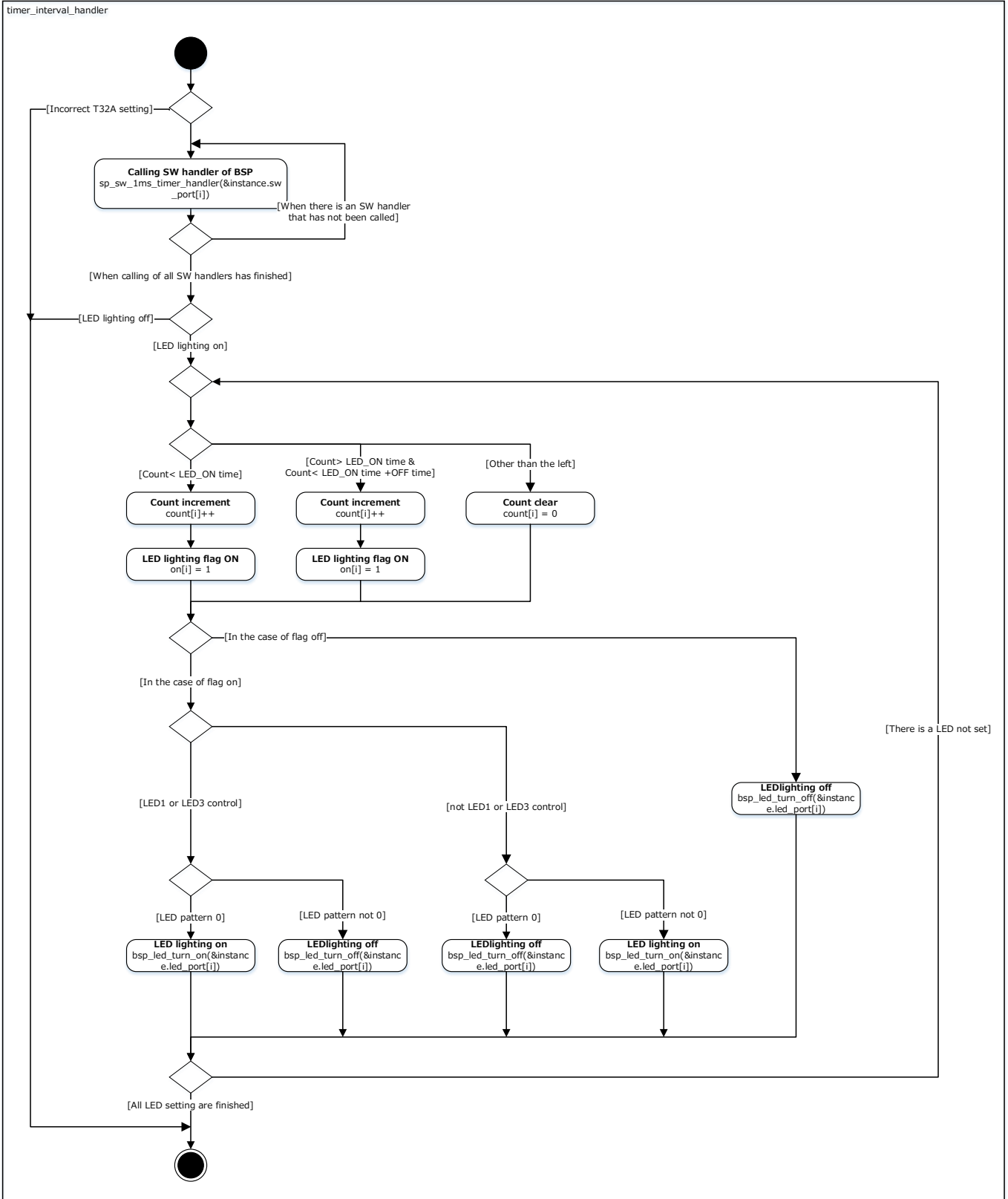


UART Reception Interrupt calling flow chart



UART Communication Error Interrupt calling flow chart





8. Revision History

Revision	Date	Description
1.0	2025-01-20	First release
1.1	2025-10-30	6.3Interrupt to Use Added M3H Interrupt Name.

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