

Application Note

TSPI_SLAVE_RECEIVE

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1. Preface

This application note describes the sample software for TSPI_SLAVE_RECEIVE using Serial Peripheral Interface (SPI).

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
CRC	Cyclic Redundancy Check
DMA	Direct Memory Access Controller
Timer	T32A:32-bit Timer Event Counter
TSPI	Serial Peripheral Interface

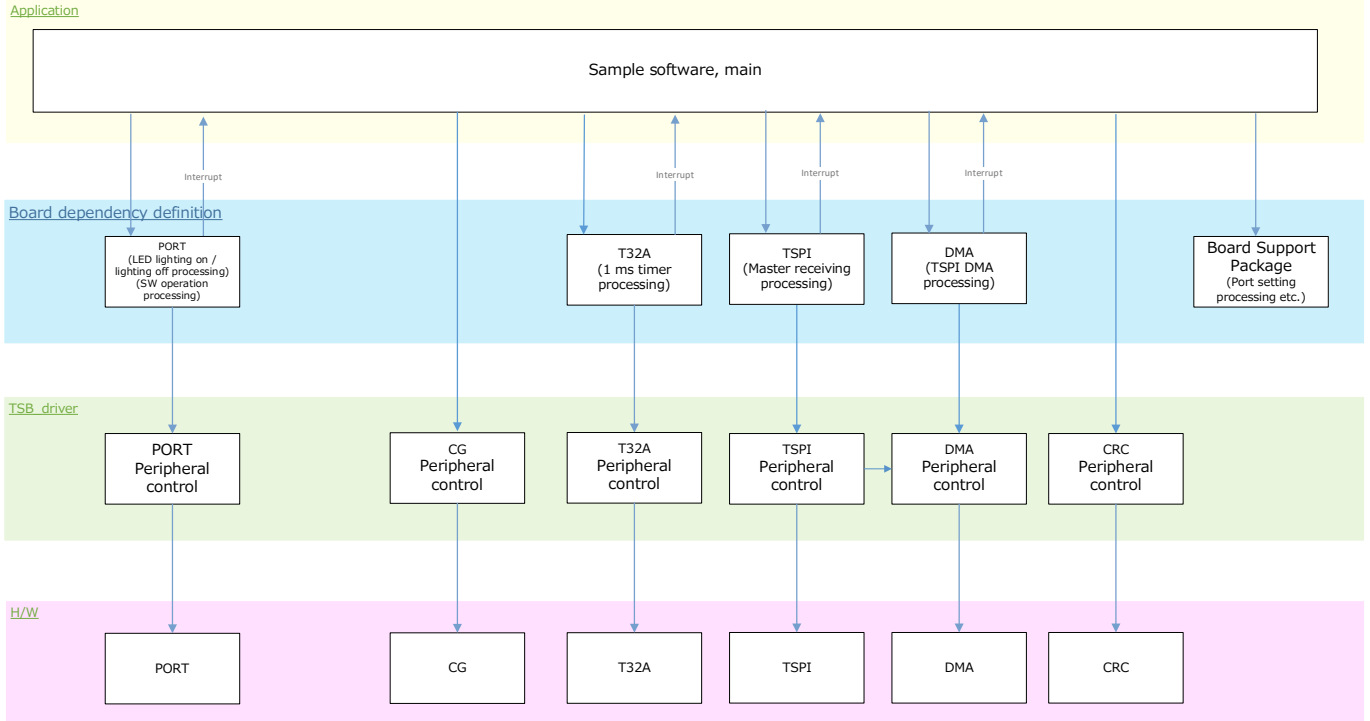
3. Reference Document

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
TSPI_SLAVE_RECEIVE	Sample program of SPI function (Slave Receive)

5. Configuration Diagram



6. Sample Program: TSPI_SLAVE_RECEIVE

This sample software that uses the Slave receive processing function of the SPI communication function to enter the reception waiting state when the switch is pressed, and switches the LED turn on / turn off each time data receive is completed.

6.1. Outlines of Operation

Turns off BSP_LED_2, BSP_LED_3, and BSP_LED_4.

When BSP_PSW_1 is pressed, BSP_LED_3 and BSP_LED_4 are turned off and data for the data size is received. The data that exceeds the data size will be discarded.

Switches the lighting status (turn on / turn off) of BSP_LED_2.

When SPI read error occurs, BSP_LED_3 is turn on.

When the CRC value of the received data and the calculated CRC value do not match, BSP_LED_4 is turn 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
TSPI	BSP_TSPI_1	SPI communication
T32A	BSP_T32A_TIMER_1	Interval timer
PORT(Push-Switch)	BSP_PSW_1	Event trigger
PORT(LED)	BSP_LED_2	For operation check
	BSP_LED_3	For operation check
	BSP_LED_4	For operation check

6.3. Interrupt to Use

Interrupt	Outlines
(Note1)	T32A Timer A Timer counter increment every 1ms
(Note2)	SPI receive interrupt
(Note3)	SPI error interrupt
INTDMAATC	DMA transmit end interrupt
INTDMAAERR	DMA error interrupt

Note1: For SBK-M471, "INTT32A00AC".

Note2: For SBK-M471, "INTSC0RX".

Note3: For SBK-M471, "INTSC0ERR".

6.4. Configuration

“main.c” configuration setting.

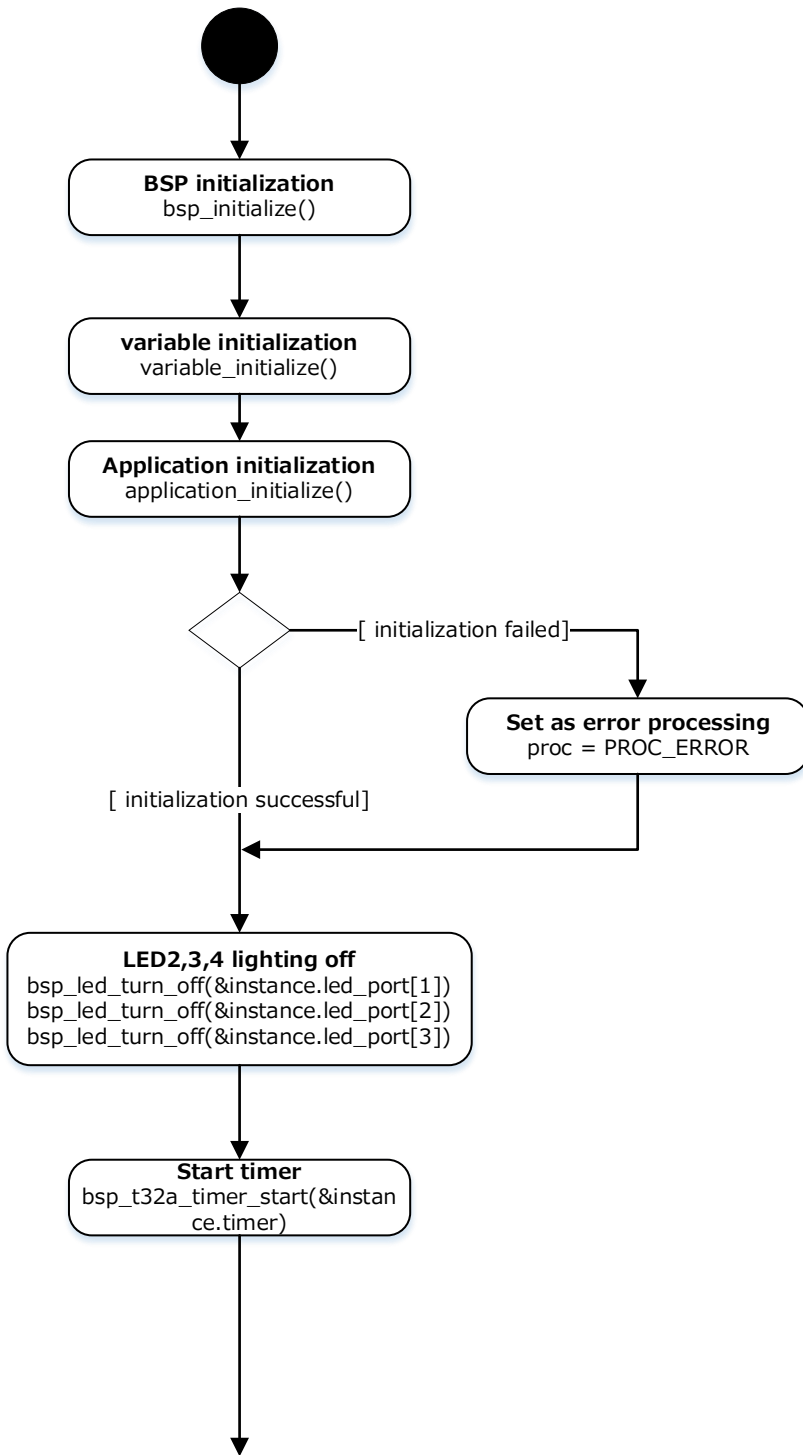
Configuration	Soft Definition Name	Current Value (Defaults)	Description
Data size	BSP_DATA_LENGTH	12	Data size (unit: byte) Compilation switch Set to 14 by the BSP_CHK_CODE setting.
Check CODE	BSP_CHK_CODE	BSP_CHK_CODE_CRC16	BSP_CHK_CODE_CRC16 and BSP_CHK_CODE_CRC32 can be switched
Communication Control	BSP_REQUEST_MODE	BSP_FIFO_MODE	BSP_FIFO_MODE and BSP_DMA_MODE can be switched.
Send Fill Level Setting	BSP_RX_FILL_LEVEL	4	Set to RIL in TSPIxCR2

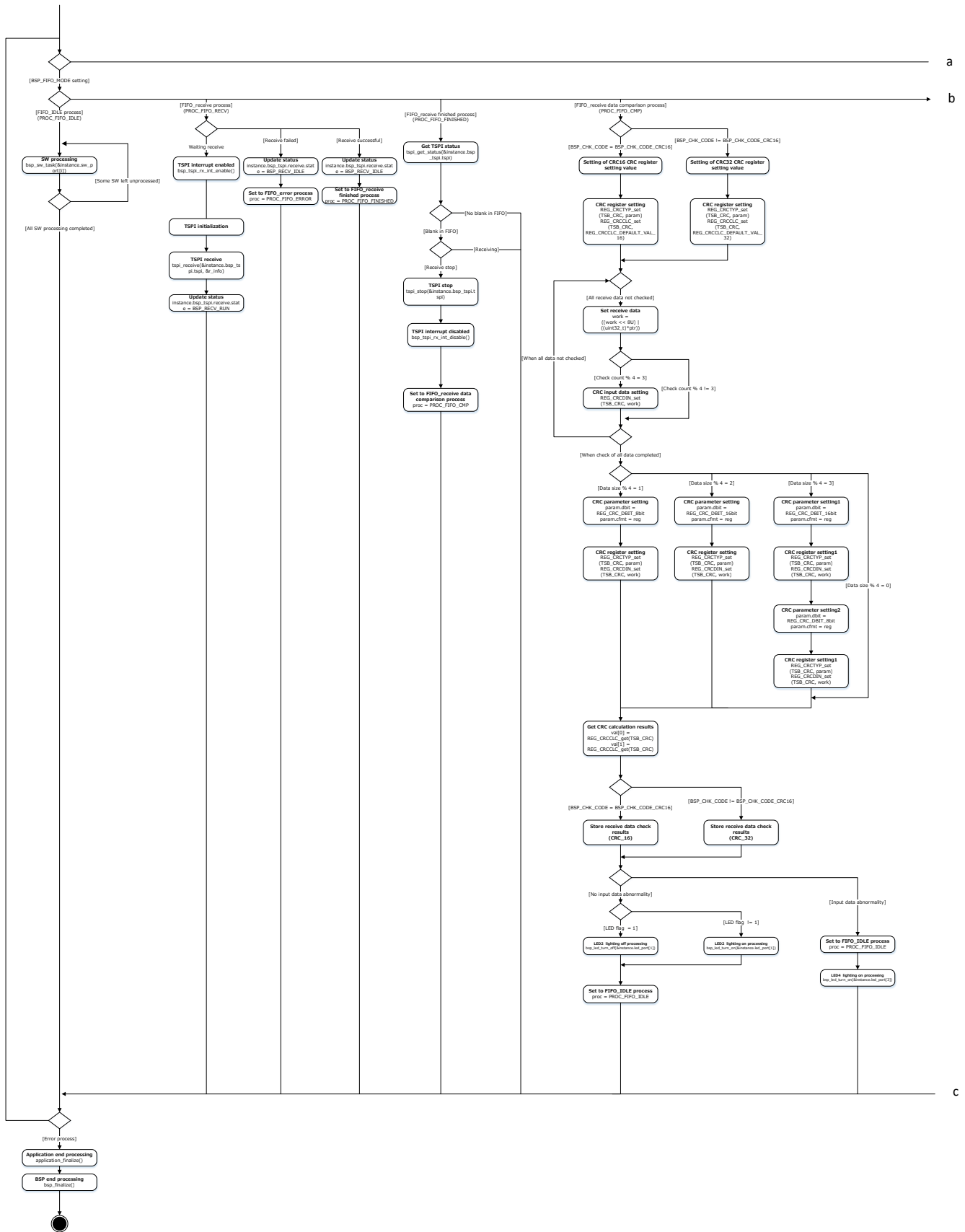
6.5. Example of Terminal Emulator Output

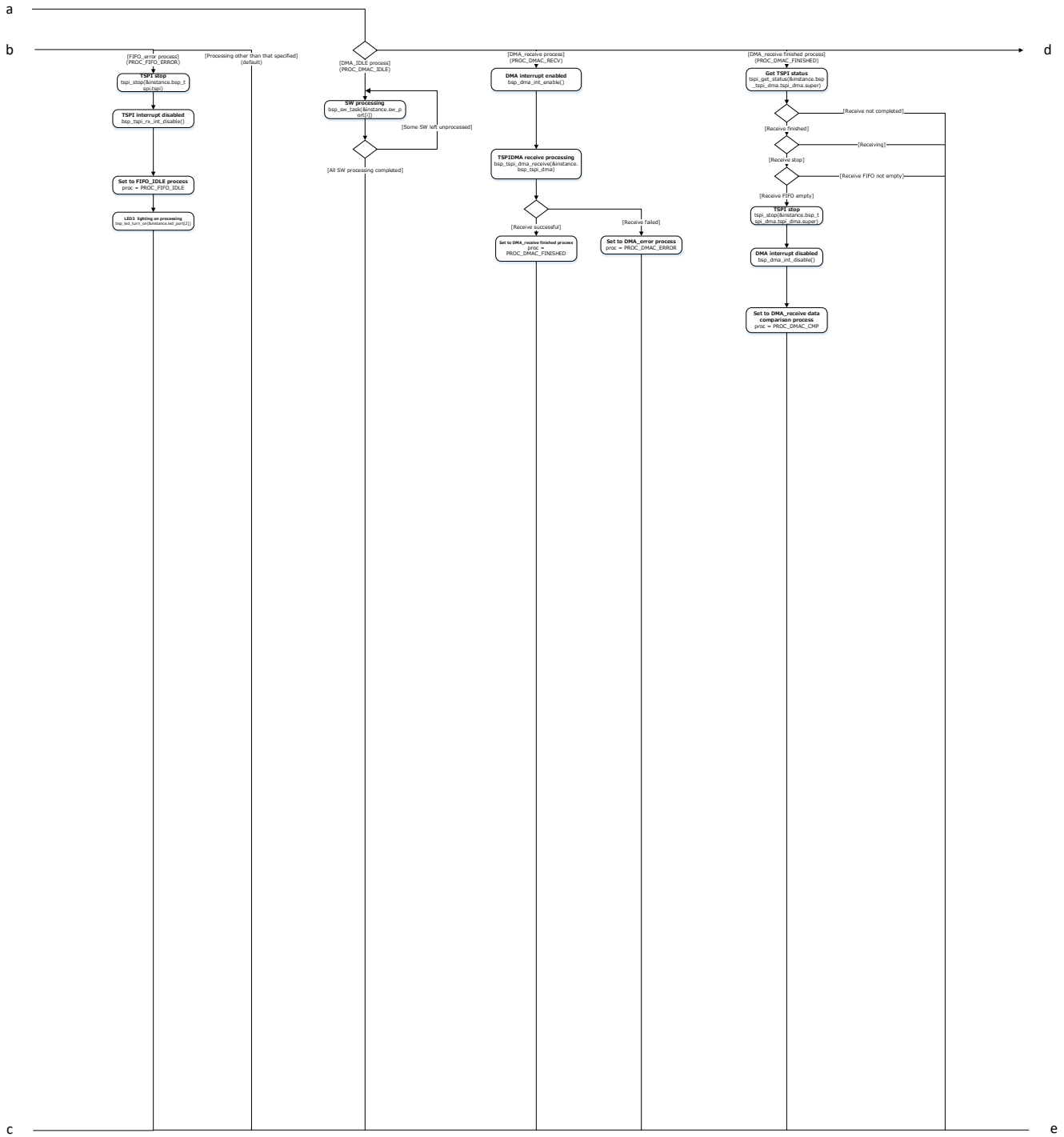
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7. Activity diagram

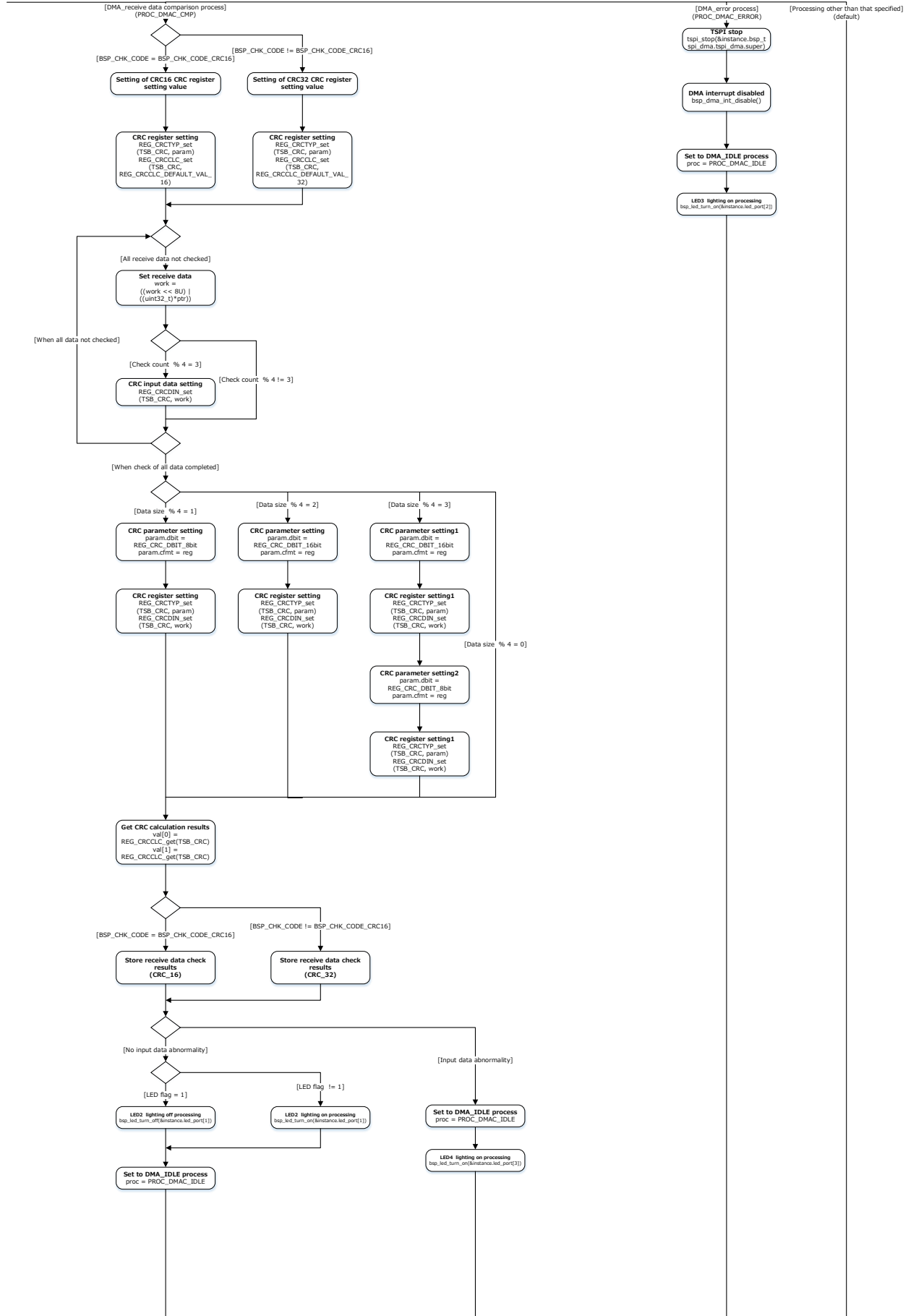
7.1. main





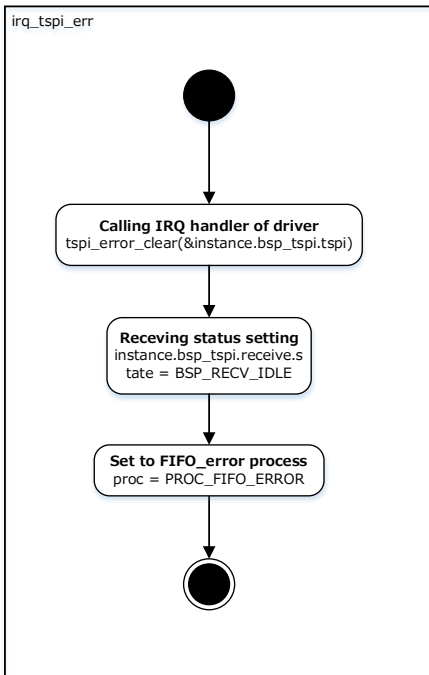
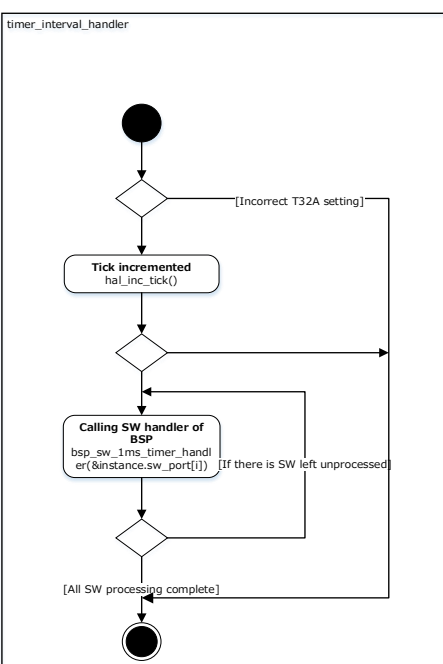
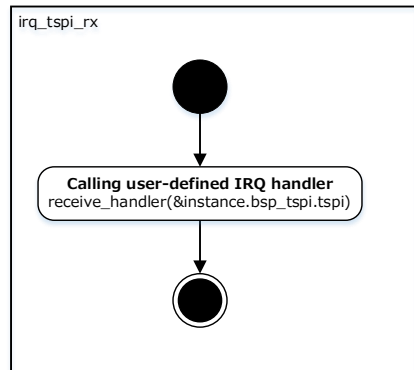
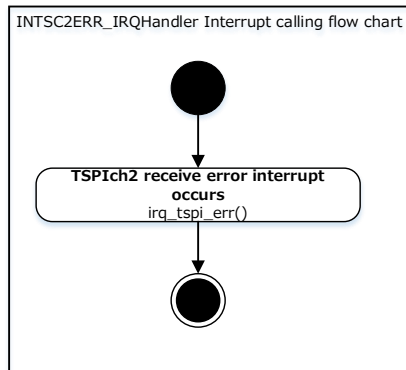
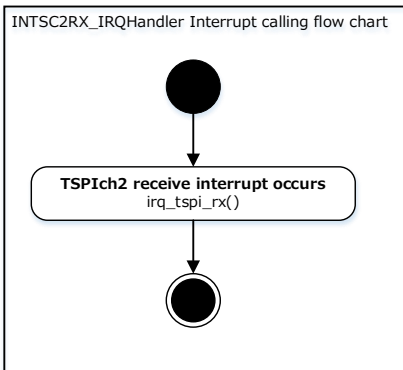
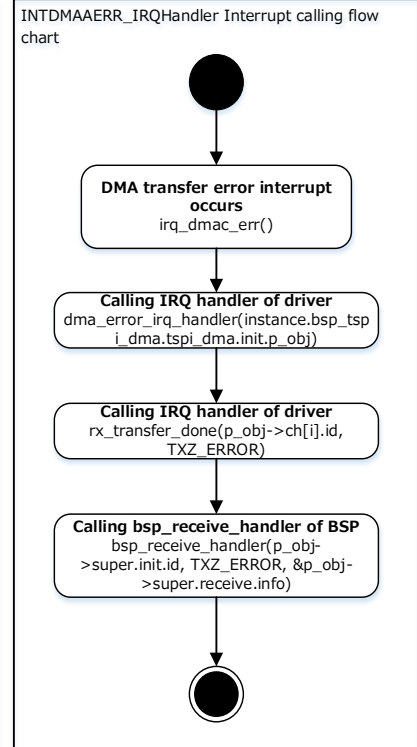
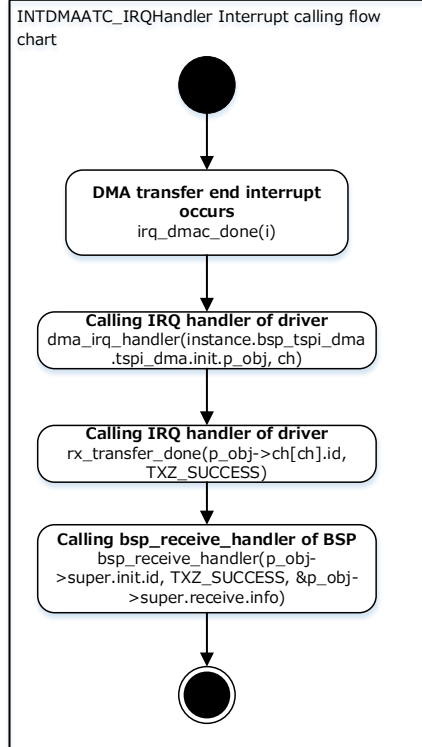
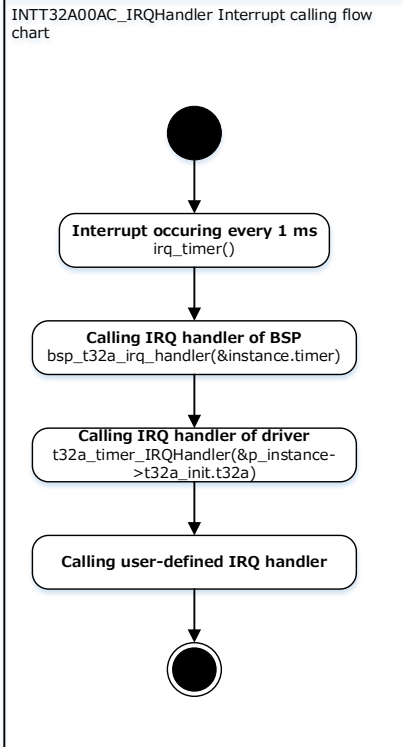


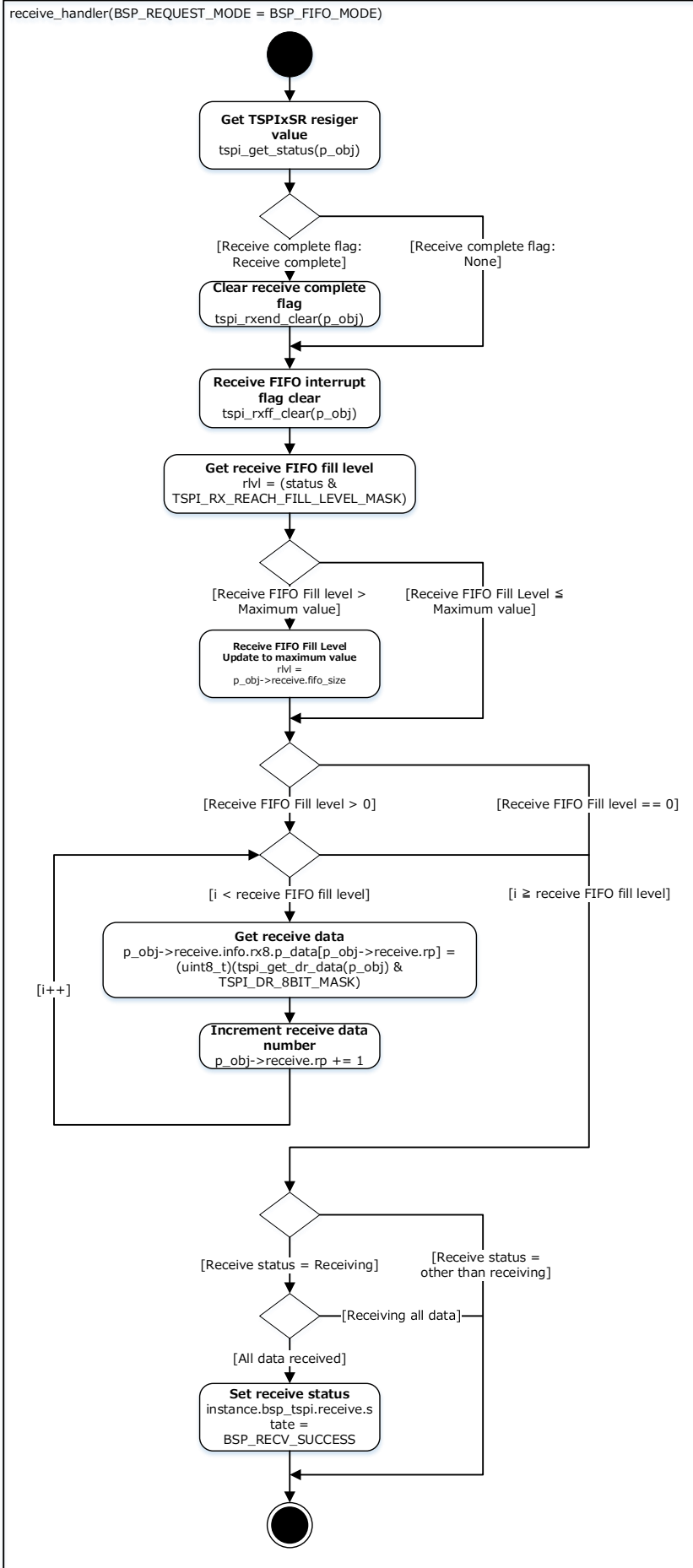
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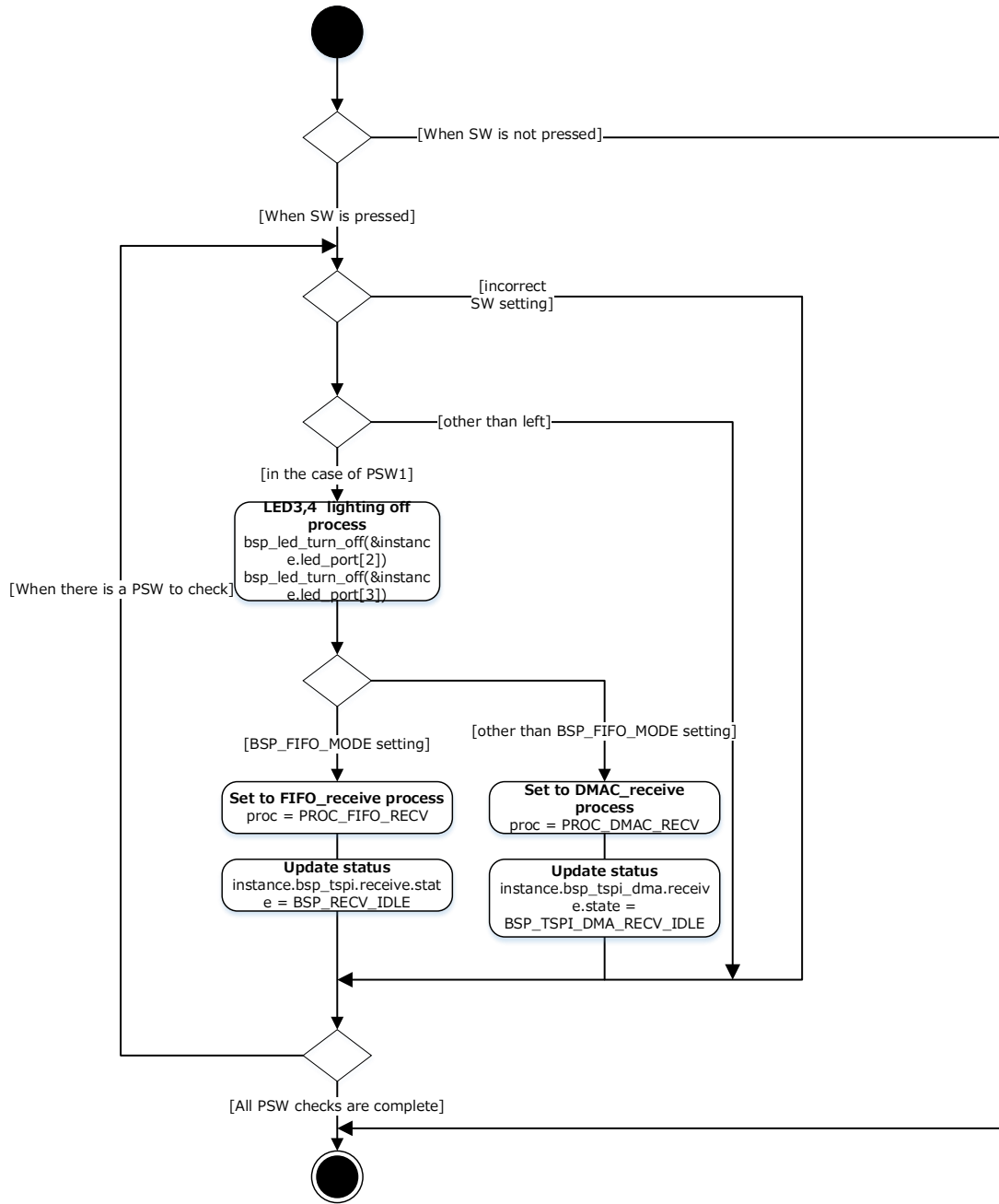
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7.2. Interrupt





sw_state_change_handler



8. Revision History

Revision	Date	Description
1.0	2025-01-20	First release

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