Application Note

RAMParity

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1. Preface

This application note describes sample software RAMparity using RAM parity(RAMP).
This document helps the user check operation of a product under development and develop its program.

2. Technical Term

Term/Abbreviation	Definition
CG	Clock Control and Operation Mode
RAMP	RAM Parity
UART	Universal Asynchronous Receiver Transmitter

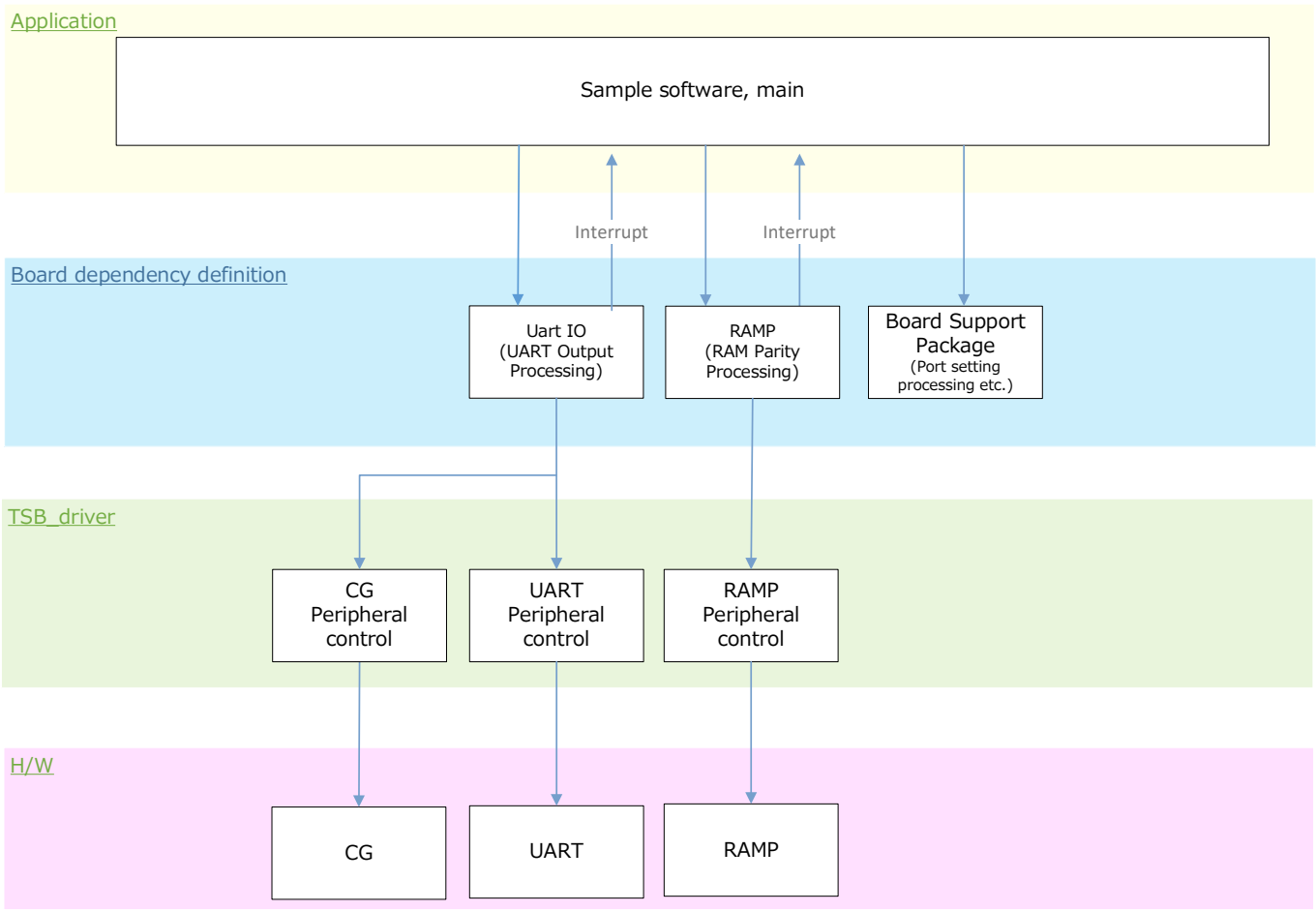
3. Reference Document

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
RAMParity	Sample program of RAMParity function

5. Configuration Diagram



6. Sample Program: RAMParity

This is sample software that saves the character string input from the terminal emulator by adding parity to the RAM using the write command, and then uses a read command to check the parity of the data stored in RAM and displays it to the terminal emulator.

6.1. Outlines of Operation

If a Command is entered, the process will be performed according to the entered Command.
Use the write command to add parity to RAM and save it.
Use the read command to check the parity of the data saved in RAM and display it on the console.

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
UART	BSP_UART_1	For terminal emulator communication

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
Write DATA MAX.	BSP_WRITE_DATA_MAX	10	Number of characters that can be written (Unit: characters)
RAM TOP ADDRESS	bsp_ram1	0x20001000	Note: When changing the address, it will be placed in RAM Area 0 and 1.

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

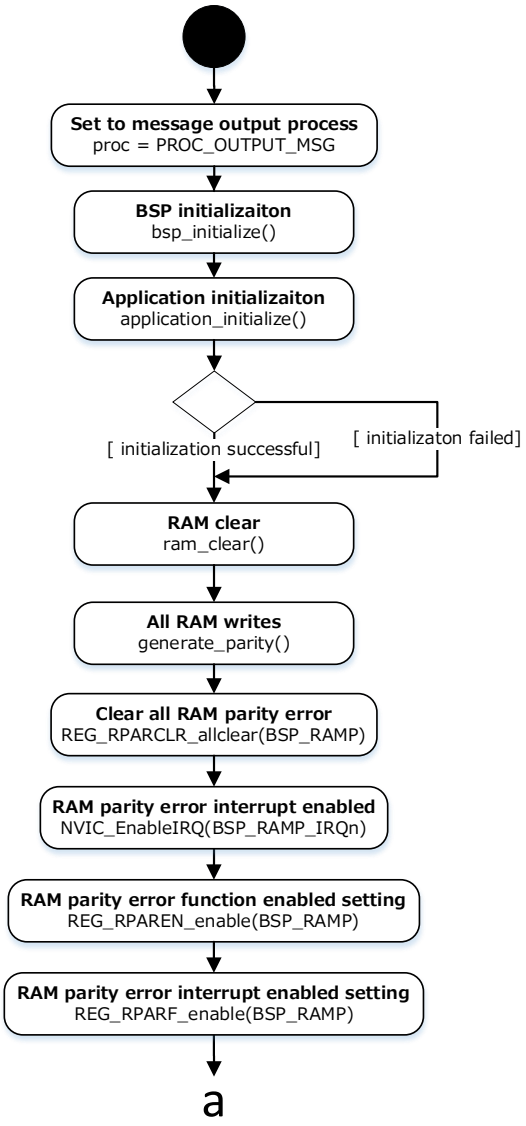
```
command > write 0
write data > 0
command > read
read data > 0
```

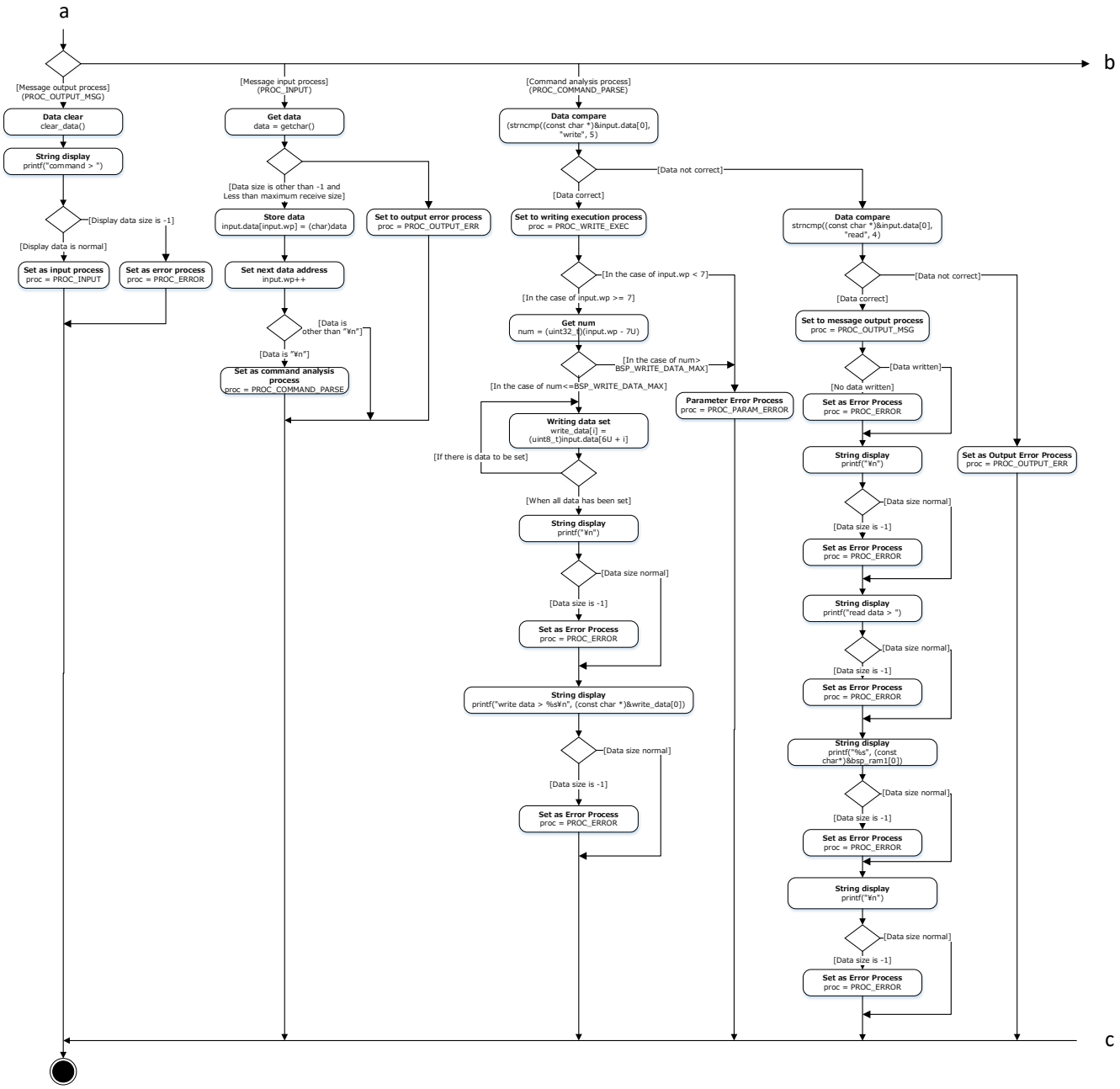
6.5.2. Case of Error Occurrence

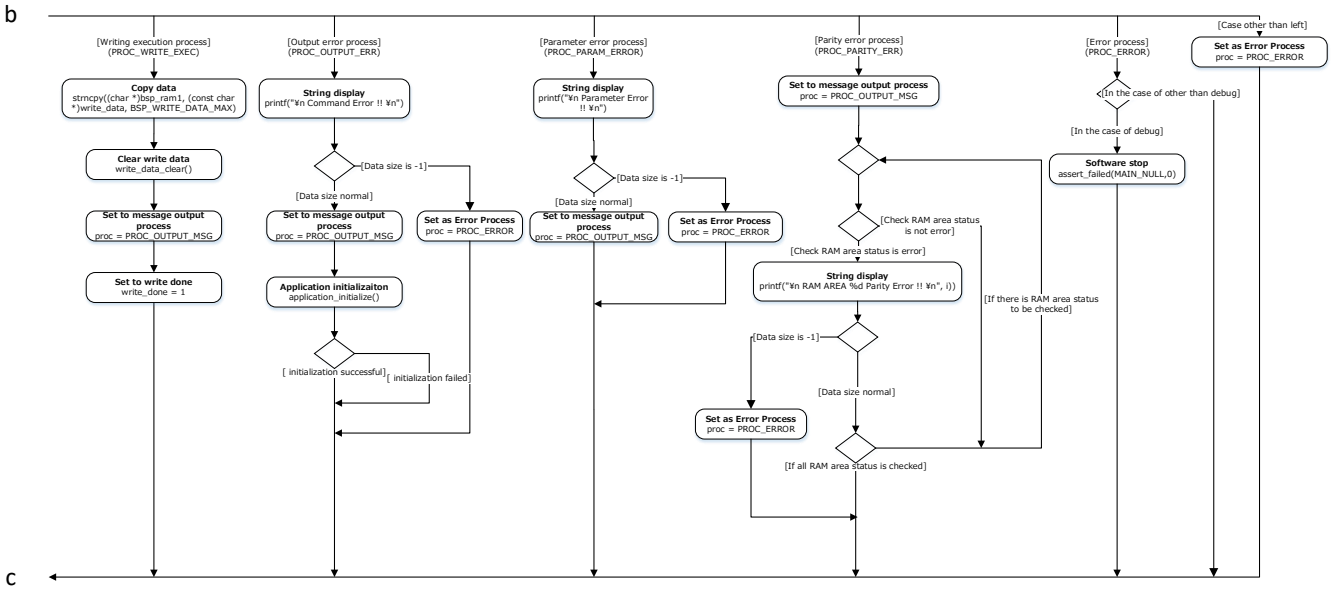
```
command > A
  Command Error !!

command > write 0123456789
write data > 012345679

command > write 0123456789A
  Parameter Error !!
```

7. Activity diagram

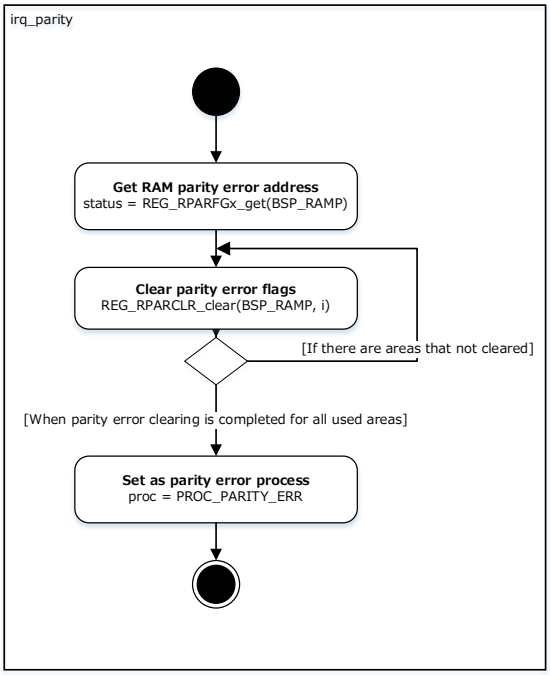
7.1. main

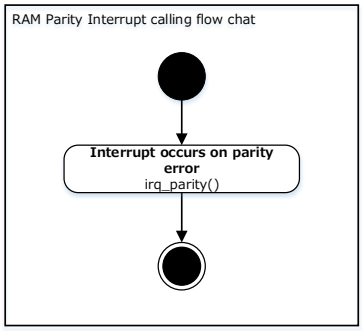


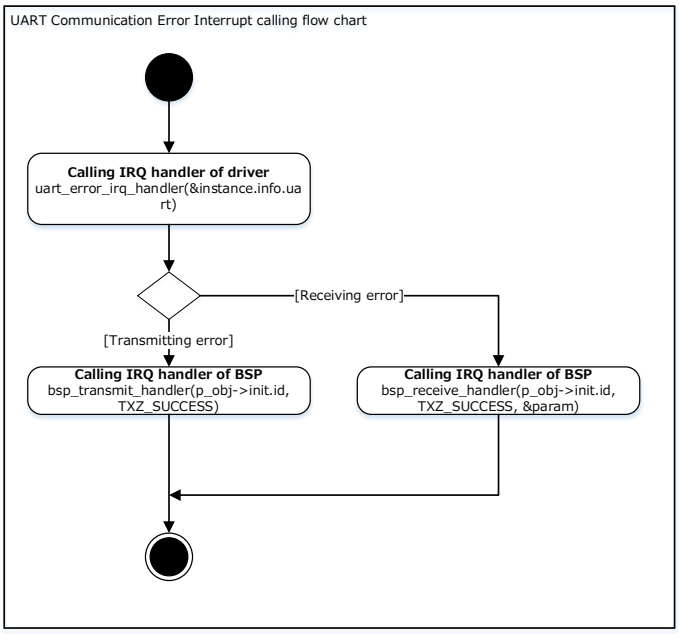

a
b
c
[Message output process]
(PROC_OUTPUT_MSG)
Data clear
clear_data()
String display
printf("command > ")
[Display data size is -1]
[Display data is normal]
Set as input process
proc = PROC_INPUT
Set as error process
proc = PROC_ERROR
[Message input process]
(PROC_INPUT)
Get data
data = getchar()
[Data size is other than -1 and
Less than maximum receive size]
Store data
input.data[input.wp] = (char)data
Set next data address
input.wp++
[Data is other than "¥n"]
[Data is "¥n"]
Set as command analysis process
proc = PROC_COMMAND_PARSE
Set to output error process
proc = PROC_OUTPUT_ERR
[Command analysis process]
(PROC_COMMAND_PARSE)
Data compare
(strncmp((const char *)&input.data[0], "write", 5)
[Data not correct]
[Data correct]
Set to writing execution process
proc = PROC_WRITE_EXEC
[In the case of input.wp < 7]
[In the case of input.wp >= 7]
Get num
num = (uint32_t)(input.wp - 7U)
[In the case of num> BSP_WRITE_DATA_MAX]
[In the case of num<=BSP_WRITE_DATA_MAX]
Parameter Error Process
proc = PROC_PARAM_ERROR
Writing data set
write_data[i] = (uint8_t)input.data[6U + i]
[If there is data to be set]
[When all data has been set]
String display
printf("¥n")
[Data size normal]
[Data size is -1]
Set as Error Process
proc = PROC_ERROR
String display
printf("write data > %s¥n", (const char *)&write_data[0])
Data compare
strncmp((const char *)&input.data[0], "read", 4)
Set to message output process
proc = PROC_OUTPUT_MSG
[Data written]
[No data written]
String display
printf("read data > ")
String display
printf("%s", (const char*)&bsp_ram1[0])
Set as Output Error Process
proc = PROC_OUTPUT_ERR

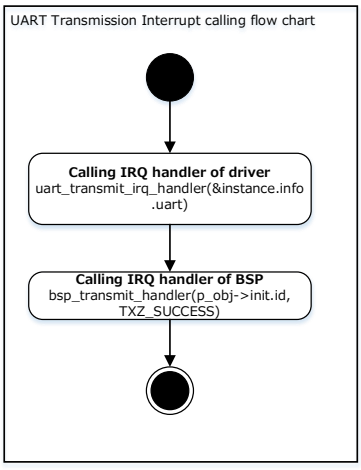

b
[Writing execution process]
(PROC_WRITE_EXEC)
Copy data
strncpy((char *)bsp_ram1, (const char *)write_data, BSP_WRITE_DATA_MAX)
Clear write data
write_data_clear()
Set to message output process
proc = PROC_OUTPUT_MSG
Set to write done
write_done = 1
[Output error process]
(PROC_OUTPUT_ERR)
String display
printf("¥n Command Error !! ¥n")
[Data size is -1]
[Data size normal]
Set to message output process
proc = PROC_OUTPUT_MSG
Application initializaiton
application_initialize()
[initialization successful]
[initialization failed]
Set as Error Process
proc = PROC_ERROR
[Parameter error process]
(PROC_PARAM_ERROR)
String display
printf("¥n Parameter Error !! ¥n")
[Data size is -1]
[Data size normal]
Set to message output process
proc = PROC_OUTPUT_MSG
Set as Error Process
proc = PROC_ERROR
[Parity error process]
(PROC_PARITY_ERR)
Set to message output process
proc = PROC_OUTPUT_MSG
[Check RAM area status is not error]
[Check RAM area status is error]
String display
printf("¥n RAM AREA %d Parity Error !! ¥n", i))
[Data size is -1]
[Data size normal]
Set as Error Process
proc = PROC_ERROR
[If there is RAM area status to be checked]
[If all RAM area status is checked]
[Error process]
(PROC_ERROR)
[In the case of other than debug]
[In the case of debug]
Software stop
assert_failed(MAIN_NULL,0)
[Case other than left]
Set as Error Process
proc = PROC_ERROR
c

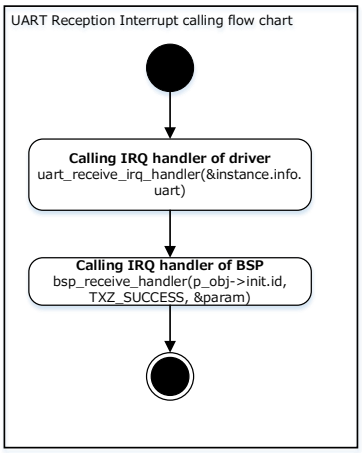
7.2. Interrupt











8. Revision History

Revision	Date	Description
1.0	2025-01-20	First release
1.1	2025-10-30	6.3 Interrupt to Use Added M3H Interrupt Name.
1.2	2026-07-30	6.3 Interrupt to Use Detailed information is transcribed into the User's Manual

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