

S5D9 I2C Bus Example (SCI Framework Version)

By

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(2/2/2018)

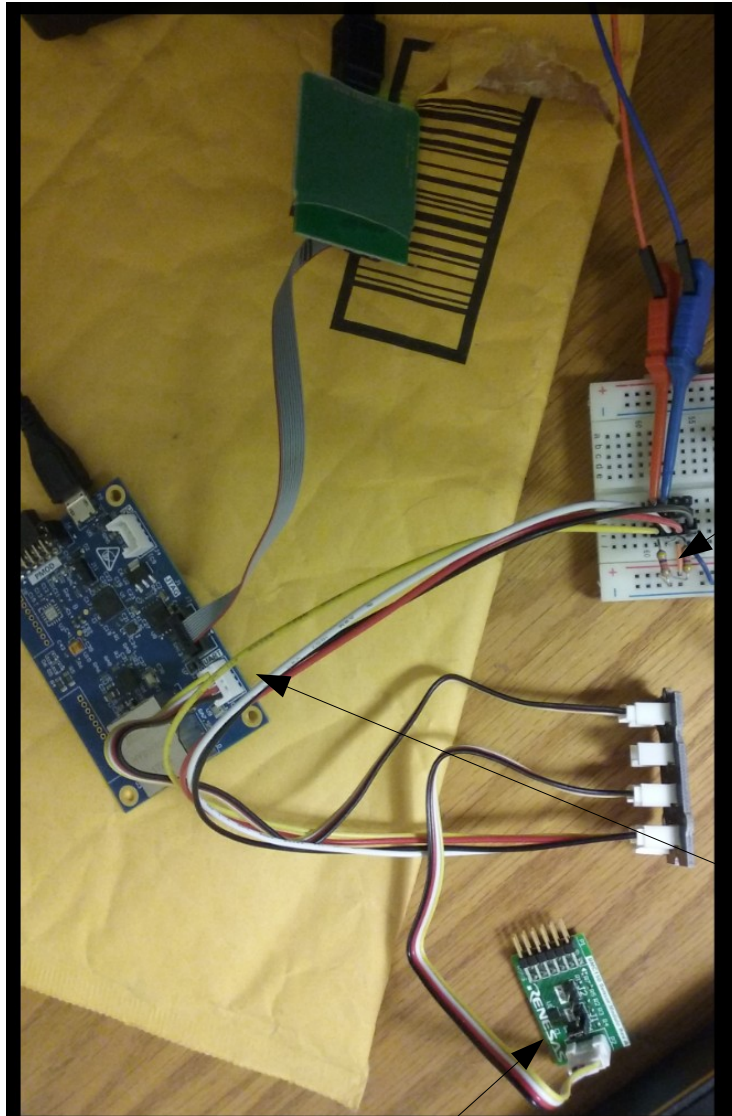
<https://www.miketechuniverse.com>

E2 Studio 5.4.0.023

SSP 1.3.0

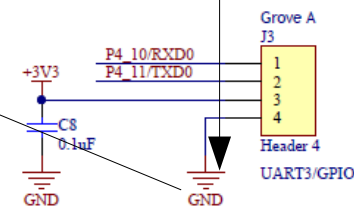
ThreadX RTOC required

Since UART grove does not have pull up resistors, we need to add manually. Otherwise, the connection can be very simple.



Note: No pullup resistors for P4_10/11. Need to add a pair of 4.7k ohm pull up resistors between SCL/SDA and VCC.

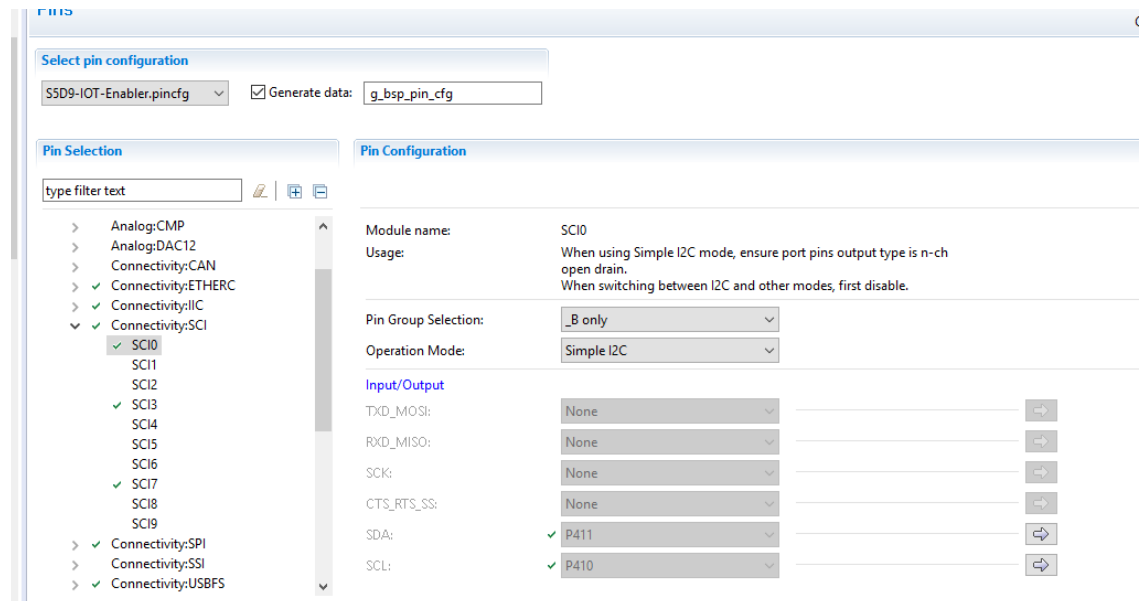
I2C hub (used to add the pull up resistors!)



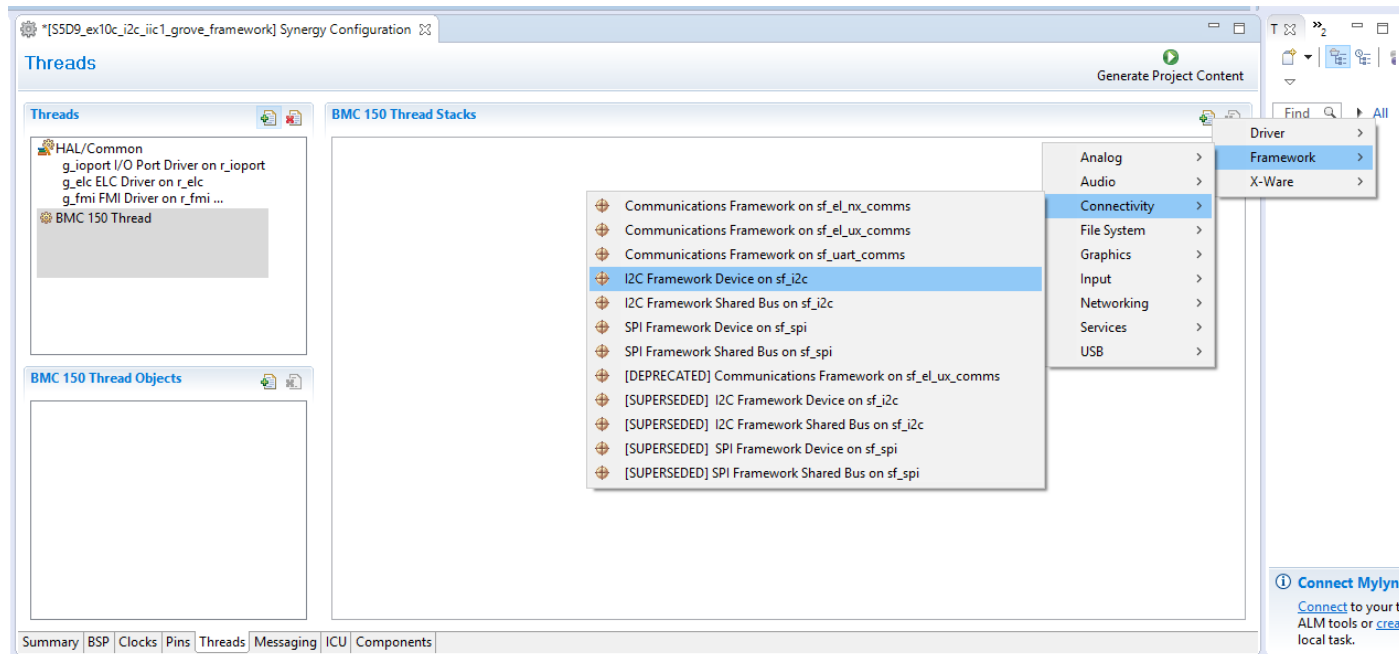
Open for the I2C mode

I2C Example by Michael C. Li

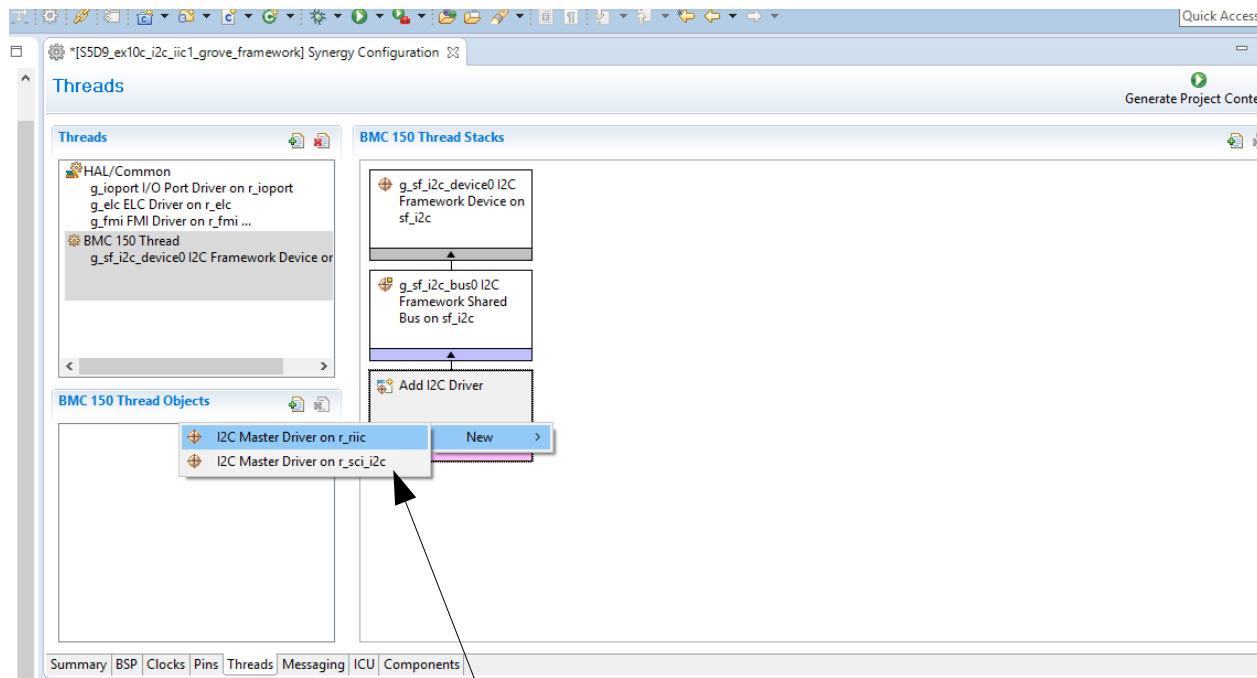
Change SCI0 from UART to I2C



Add New Thread (BMC 150) and add I2C Framework



Choose r_sci_i2c driver



Select the bottom one

Create the new thread

The screenshot displays the Synergy Configuration tool interface for a project named [SSD9_BUS_LESSON1d_I2C_sci_framework]. The main window is divided into several panes:

- Threads:** A list of threads including HAL/Common, g_elc ELC Driver on r_elc, g_fmi FMI Driver on r_fmi, g_cgc CGC Driver on r_cgc, and the selected BMC 150 Thread.
- BMC 150 Thread Objects:** A list of objects associated with the BMC 150 Thread.
- BMC 150 Thread Stacks:** A diagram showing the stack of components for the BMC 150 Thread, including g_sf_i2c_device0 I2C Framework Device on sf_i2c, g_sf_i2c_bus0 I2C Framework Shared Bus on sf_i2c, g_i2c0 I2C Master Driver on r_sci_i2c, and two transfer drivers (g_transfer0 and g_transfer1) on r_dtc Event SCI0 TXI and RXI respectively.
- Properties:** A table showing the properties of the BMC 150 Thread.

The Properties pane is currently selected, showing the following table:

Property	Value
Thread	
Symbol	bmc150_thread
Name	BMC 150 Thread
Stack size (bytes)	1024
Priority	15
Auto start	Enabled
Time slicing interval (ticks)	1

Change Properties

The screenshot displays the Synergy Configuration tool interface. The top toolbar includes icons for various functions. The main window is titled "[SSD9_BUS_LESSON1d_i2c_sci_framework] Synergy Configuration".

The **Threads** view on the left shows a list of threads and their components. The **BMC 150 Thread** is selected, showing its components: **g_elc ELC Driver on r_elc**, **g_fmi FMI Driver on r_fmi**, **g_cgc CGC Driver on r_cgc**, and **g_sf_i2c_device0 I2C Framework Device on sf_i2c**.

The **BMC 150 Thread Objects** view on the right shows a hierarchical stack of components. The stack includes: **g_sf_i2c_device0 I2C Framework Device on sf_i2c**, **g_sf_i2c_bus0 I2C Framework Shared Bus on sf_i2c**, **g_i2c0 I2C Master Driver on r_sci_i2c**, **g_transfer0 Transfer Driver on r_dtc Event SCIO TXI**, and **g_transfer1 Transfer Driver on r_dtc Event SCIO RXI**.

The **Properties** view at the bottom shows the settings for the **g_sf_i2c_device0 I2C Framework Device on sf_i2c**. The **Settings** tab is selected, and the **Information** section is expanded. The properties are listed in a table:

Property	Value
Common	
Parameter Checking	Enabled
Module g_sf_i2c_device0 I2C Framework Device on sf_i2c	
Name	g_sf_i2c_device0
Slave Address	0x11
Address Mode	7-Bit

Change Properties

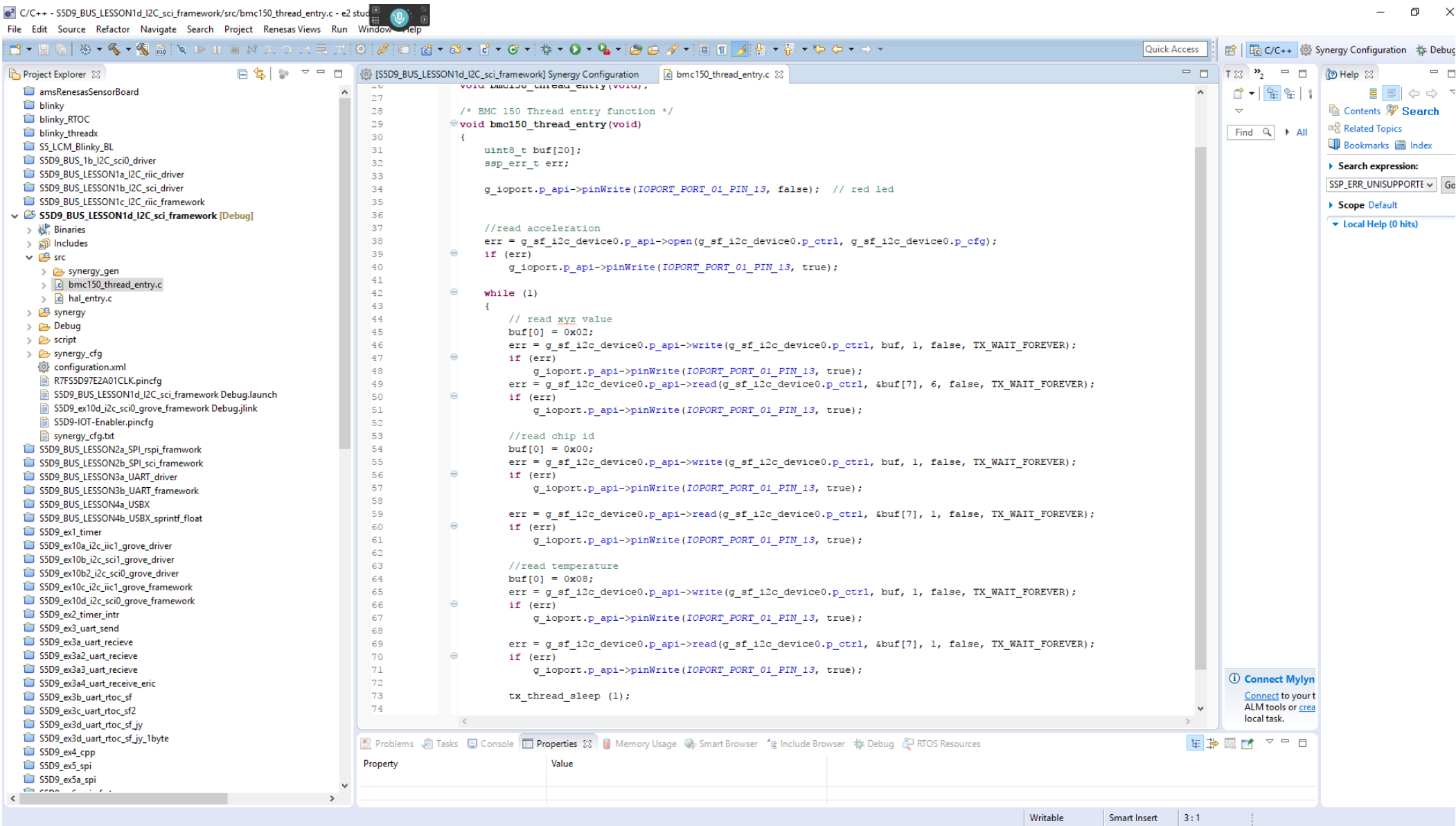
The screenshot shows the Synergy Configuration tool for the project [SSD9_BUS_LESSON1d_i2c_sci_framework]. The 'Threads' view on the left lists the 'BMC 150 Thread' containing the 'g_sf_i2c_device0 I2C Framework Device or'. The 'BMC 150 Thread Stacks' view on the right shows a stack of components: 'g_sf_i2c_device0 I2C Framework Device on sf_i2c', 'g_sf_i2c_bus0 I2C Framework Shared Bus on sf_i2c', 'g_i2c0 I2C Master Driver on r_sci_i2c', and two transfer drivers. An arrow points from the 'g_i2c0 I2C Master Driver on r_sci_i2c' component in the stack to its properties in the bottom pane.

The 'g_i2c0 I2C Master Driver on r_sci_i2c' properties are shown in the bottom pane:

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_i2c0 I2C Master Driver on r_sci_i2c	
Name	g_i2c0
Channel	0
Rate	Standard
Slave Address	0
Address Mode	7-Bit
SDA Output Delay (nano seconds)	300
Bit Rate Modulation Enable	Enable
Callback	NULL
Receive Interrupt Priority	Priority 2
Transmit Interrupt Priority	Priority 2

Use channel 0 since sci0 is used.

Main Code



Device ID Read (0xFA)

Debug - SSD9_BUS_LESSON1d_i2c_framework/src/bmc150_thread_entry.c - e2 studio

File Edit Source Refactor Navigate Search Project Renesas Views Run Window Help

Debug SSD9_BUS_LESSON1d_i2c_framework Debug [Renesas GDB Hardware Debugging]

SSD9_BUS_LESSON1d_i2c_framework.elf [1]

Thread #1 1 (single core) (Suspended: Step)

bmc150_thread_entry() at bmc150_thread_entry.c:60 0x5012

_tx_thread_shell_entry() at tx_thread_shell_entry.c:164 0x61c8

0xffffffff

Thread #2 1001 (single core - BMC 150 Thread [Ready RC:6309]) (Suspended: User Request)

bmc150_thread_entry() at bmc150_thread_entry.c:60 0x5012

_tx_thread_shell_entry() at tx_thread_shell_entry.c:164 0x61c8

0xffffffff

C:/Renesas/e2_studio540_ssp130_s5d9iot/DebugComp/arm-none-eabi-gdb (7.8.2)

GDB server

Expression	Type	Value	Address
temperatureF		Error: Multiple errors report...	
humidityP		Error: Multiple errors report...	
err	ssp_err_t	SSP_SUCCESS	
buf	uint8_t [20]	0x1ffe2a7c <bmc150_threa...	0x1ffe2a7c
buf[0]	uint8_t	0 '\0'	0x1ffe2a7c
buf[1]	uint8_t	239 'Y'	0x1ffe2a7d
buf[2]	uint8_t	239 'Y'	0x1ffe2a7e
buf[3]	uint8_t	239 'Y'	0x1ffe2a7f
buf[4]	uint8_t	0 '\0'	0x1ffe2a80
buf[5]	uint8_t	0 '\0'	0x1ffe2a81
buf[6]	uint8_t	0 '\0'	0x1ffe2a82
buf[7]	uint8_t	250 'U'	0x1ffe2a83
buf[8]	uint8_t	7 'a'	0x1ffe2a84
buf[9]	uint8_t	161 'i'	0x1ffe2a85
buf[10]	uint8_t	0 '\0'	0x1ffe2a86
buf[11]	uint8_t	113 'q'	0x1ffe2a87
buf[12]	uint8_t	65 'A'	0x1ffe2a88
buf[13]	uint8_t	0 '\0'	0x1ffe2a89
buf[14]	uint8_t	0 '\0'	0x1ffe2a8a
buf[15]	uint8_t	0 '\0'	0x1ffe2a8b
buf[16]	uint8_t	0 '\0'	0x1ffe2a8c
buf[17]	uint8_t	0 '\0'	0x1ffe2a8d

Name : buf[7]
Details: 250 'U'
Default: 250 'U'
Decimal: 250
Hex: 0xfa
Binary: 11111010
Octal: 0372

[SSD9_BUS_LESSON1d_i2c_framework] Synergy Configuration

bmc150_thread_entry.c

startup_SSD9.c

main.c

_skip_vfp_restore() at tx_thread_schedule.c:353 0x6774

```
52
53 //read chip id
54 00004fec buf[0] = 0x00;
55 00004fee err = g_sf_i2c_device0.p_api->write(g_sf_i2c_device0.p_ctrl, buf, 1, false, TX_WAIT_FOREVER);
56 00004ffe if (err)
57 00005092 g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
58
59 00005002 err = g_sf_i2c_device0.p_api->read(g_sf_i2c_device0.p_ctrl, &buf[7], 1, false, TX_WAIT_FOREVER);
60 00005012 if (err)
61 00005084 g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
62
```

Outline Project Explorer

- amsRenasasSensorBoard
- blinky
- blinky_RTIC
- blinky_threadx
- S5_LCM_Blinky_BL
- SSD9_BUS_1b_i2c_sci_driver
- SSD9_BUS_LESSON1a_i2c_nic_driver
- SSD9_BUS_LESSON1b_i2c_sci_driver
- SSD9_BUS_LESSON1c_i2c_nic_framework
- SSD9_BUS_LESSON1d_i2c_sci_framework
- Rinaries

Console

Tasks Renesas Coverage Memory Usage Performance Analysis Profile Real-time Chart Trace Visual Expression ARM CoreSight ITM Live Trace... Smart Browser Problems Executables Memory RTOS Resources RTOS Resources

SSD9_BUS_LESSON1d_i2c_sci_framework Debug [Renesas GDB Hardware Debugging] C:/Renesas/e2_studio540_ssp130_s5d9iot/DebugComp/arm-none-eabi-gdb (7.8.2)

Unexpected vCont reply in non-stop mode: E31

bmc150_thread_entry () at ../src/bmc150_thread_entry.c:50

50 if (err)

Unexpected vCont reply in non-stop mode: E31

bmc150_thread_entry () at ../src/bmc150_thread_entry.c:56

56 if (err)

Unexpected vCont reply in non-stop mode: E31

bmc150_thread_entry () at ../src/bmc150_thread_entry.c:60

60 if (err)

Unexpected vCont reply in non-stop mode: E31