

S5D9 I2C Bus Example (IIC Framework Version)

By

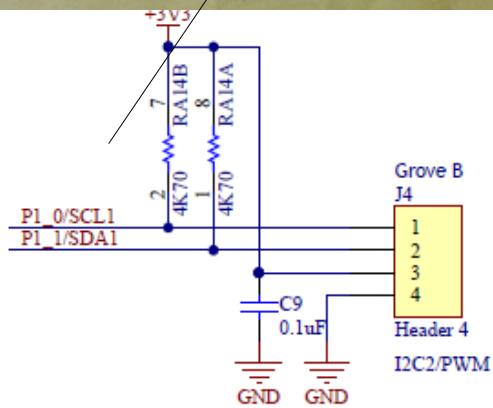
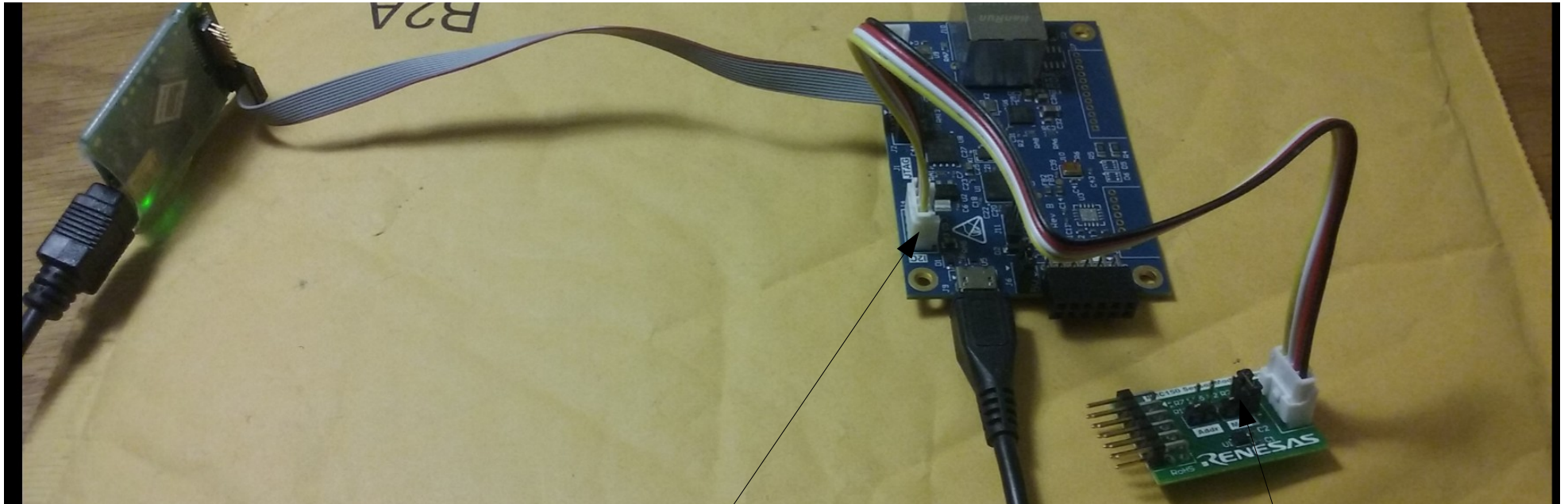
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(2/2/2018)

<https://www.miketechuniverse.com>

E2 Studio 5.4.0.023

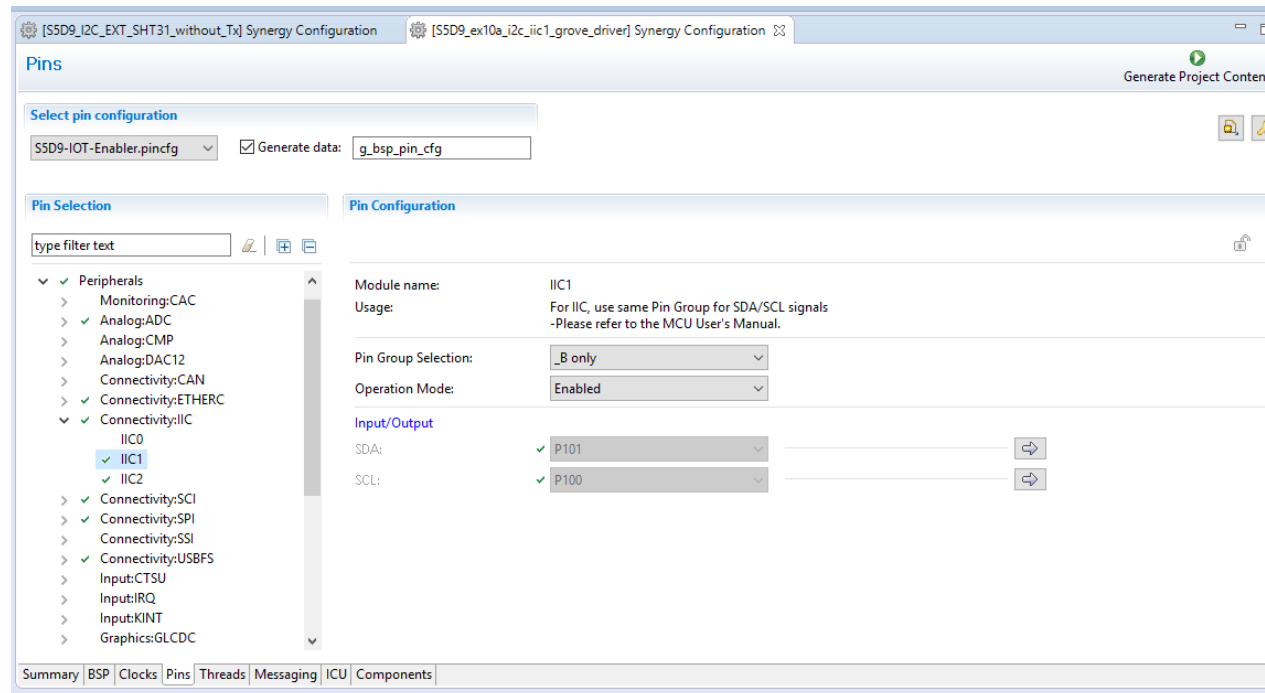
SSP 1.3.0

ThreadX RTOC required

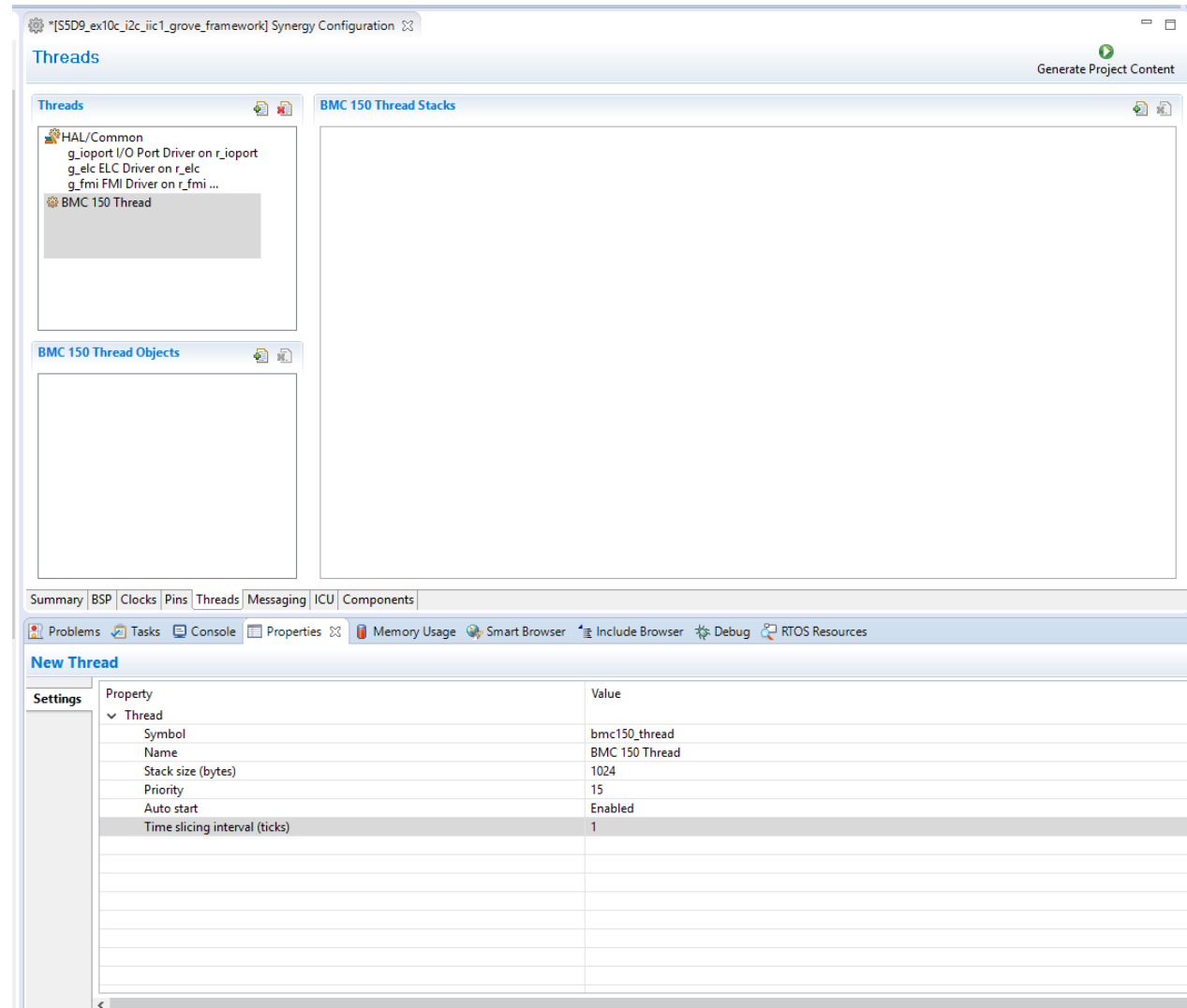


Open for the I2C mode

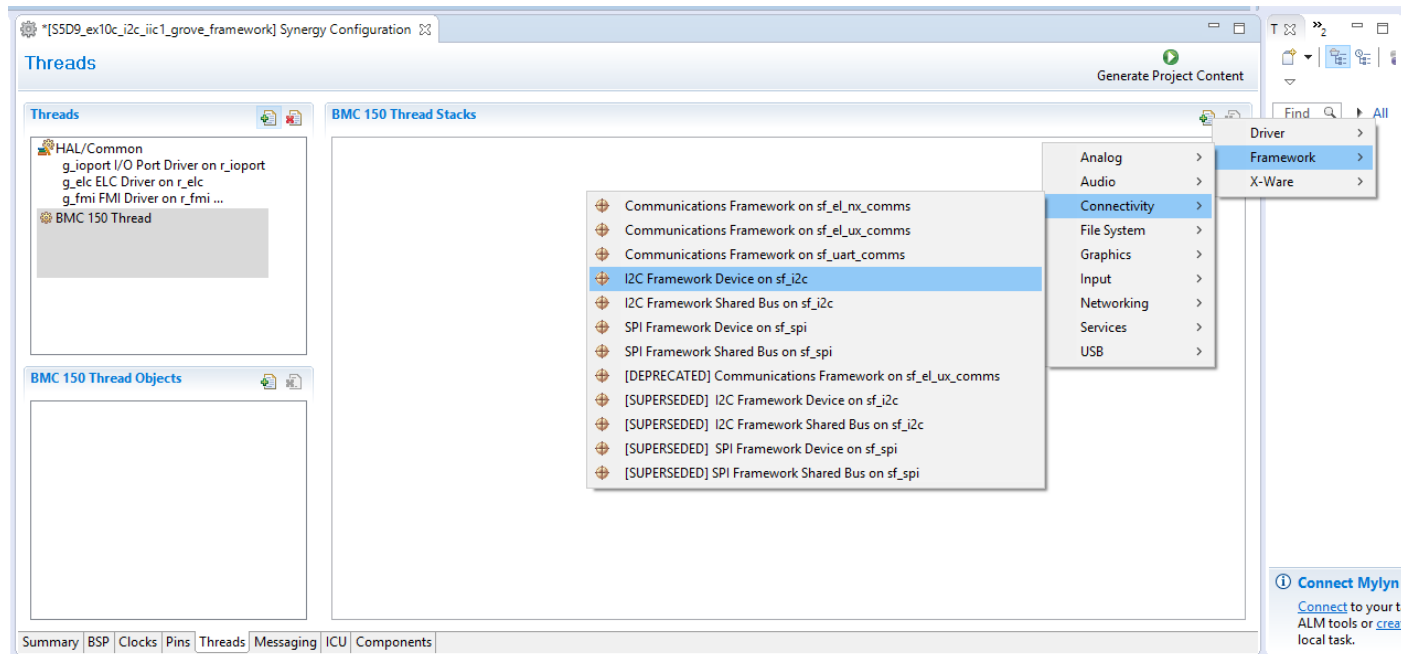
Pin Configuration



Create a new thread.



Add I2C Framework

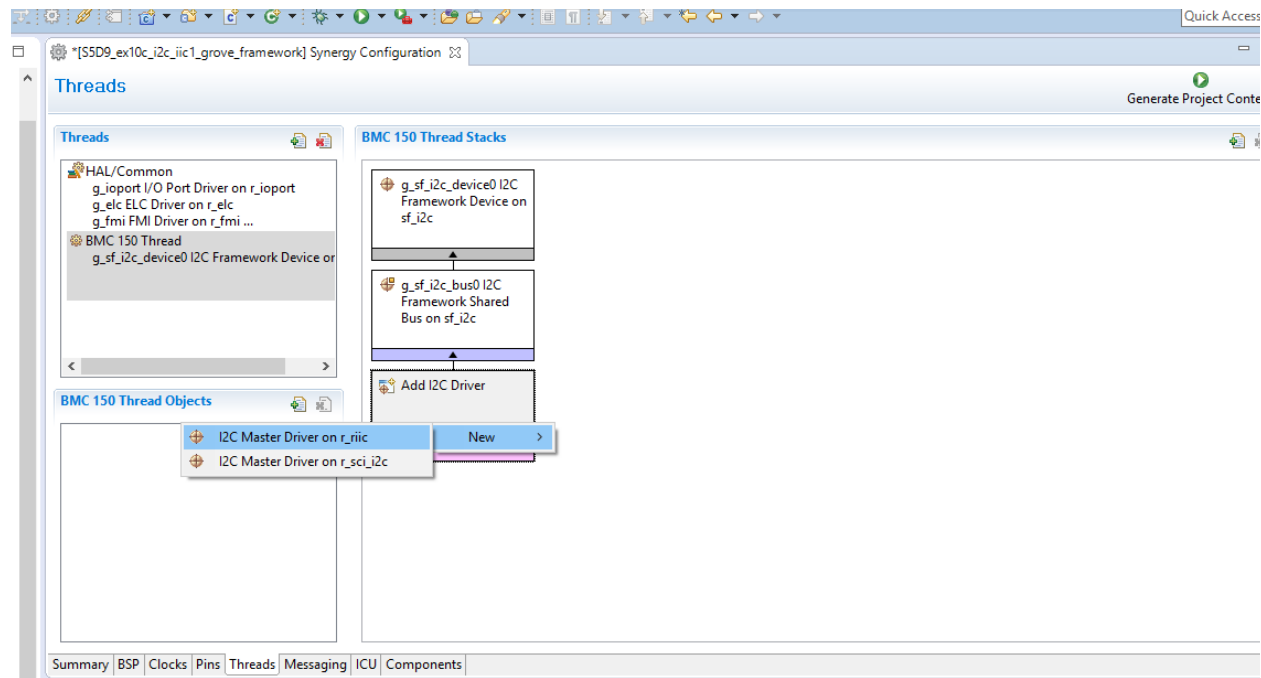


Change Properties

The screenshot displays the Synergy Configuration tool interface for the project "[SSD9_ex10c_i2c_iic1_grove_framework]". The main workspace is divided into two panes: "Threads" on the left and "BMC 150 Thread Stacks" on the right. The "Threads" pane lists components like HAL/Common, g_ioport I/O Port Driver, g_elc ELC Driver, g_fmi FMI Driver, and the selected BMC 150 Thread. The "BMC 150 Thread Stacks" pane 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, and an Add I2C Driver button. The bottom panel shows the "Properties" view for the selected component, "g_sf_i2c_device0 I2C Framework Device on sf_i2c". The "Settings" tab is active, showing a table of properties and their values.

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

Add r_iic driver



Change Properties

The screenshot shows the Synergy Configuration tool interface. The top pane displays the 'BMC 150 Thread Stacks' diagram, which illustrates the hierarchy of components in the BMC 150 thread. A component named 'g_i2c0 I2C Master Driver on r_riic' is highlighted with a blue selection bar. An arrow points from this component to the 'Properties' window at the bottom of the screen.

The 'Properties' window shows the configuration for the 'g_i2c0 I2C Master Driver on r_riic'. The 'Settings' tab is active, and the 'Information' section is expanded. The 'Channel' property is set to '1', which is highlighted by a blue selection bar. A text annotation 'Use channel 1 for iic1' with an arrow points to this value.

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_i2c0 I2C Master Driver on r_riic	
Name	g_i2c0
Channel	1
Rate	Standard
Slave Address	0
Address Mode	7-Bit
Callback	NULL
Receive Interrupt Priority	Priority 2
Transmit Interrupt Priority	Priority 2
Transmit End Interrupt Priority	Priority 2
Error Interrupt Priority	Priority 2

Locked by 'g_sf_i2c_bus0 I2C Framework Shared Bus on sf_i2c'

Main Code

```
[SSD9_ex10c_i2c_iic1_grove_framework] Syn...  hal_entry.c  bmc150_thread_entry.c  startup_SSD9.c  main.c  _skip_vfp_restore() at tx_thread_schedule.c...

24      void bmc150_thread_entry(void);
25
26      /* BMC 150 Thread entry function */
27      void bmc150_thread_entry(void)
28      {
29          uint8_t buf[20];
30          ssp_err_t err;
31
32          g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, false); // red led
33
34          //read acceleration
35          err = g_sf_i2c_device0.p_api->open(g_sf_i2c_device0.p_ctrl, g_sf_i2c_device0.p_cfg);
36          if (err)
37          {
38              g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
39
40              while (1)
41              {
42                  // read xyz value
43                  buf[0] = 0x02;
44                  err = g_sf_i2c_device0.p_api->write(g_sf_i2c_device0.p_ctrl, buf, 1, false, TX_WAIT_FOREVER);
45                  if (err)
46                  {
47                      g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
48                      err = g_sf_i2c_device0.p_api->read(g_sf_i2c_device0.p_ctrl, &buf[7], 6, false, TX_WAIT_FOREVER);
49                      if (err)
50                      {
51                          g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
52
53                          //read chip id
54                          buf[0] = 0x00;
55                          err = g_sf_i2c_device0.p_api->write(g_sf_i2c_device0.p_ctrl, buf, 1, false, TX_WAIT_FOREVER);
56                          if (err)
57                          {
58                              g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
59
60                              //read temperature
61                              buf[0] = 0x08;
62                              err = g_sf_i2c_device0.p_api->write(g_sf_i2c_device0.p_ctrl, buf, 1, false, TX_WAIT_FOREVER);
63                              if (err)
64                              {
65                                  g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
66
67                                  err = g_sf_i2c_device0.p_api->read(g_sf_i2c_device0.p_ctrl, &buf[7], 1, false, TX_WAIT_FOREVER);
68                                  if (err)
69                                  {
70                                      g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
71
72                                  }
73                              }
74                          }
75                      }
76                  }
77              }
78          }
79      }
```

Chip ID Read

The screenshot shows the Renesas Studio IDE interface during a GDB debug session. The main window displays the source code of `bmc150_thread_entry.c`, which is reading the chip ID into a buffer. The Variables window shows the state of the buffer and other variables. The Console window shows the output of the program.

Source Code (bmc150_thread_entry.c):

```
50 //read chip id
51 buf[0] = 0x00;
52 00005010 err = g_sf_i2c_device0.p_api->write(g_sf_i2c_device0.p_ctrl, buf, 1, false, TX_WAIT_FOREVER);
53 0000501a if (err)
54 0000502a g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
55 000050be
56
57 0000502e err = g_sf_i2c_device0.p_api->read(g_sf_i2c_device0.p_ctrl, &buf[7], 1, false, TX_WAIT_FOREVER);
58 0000503e if (err)
59 000050b0 g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
60
```

Variables Window:

Expression	Type	Value	Address
cmd		Error: Multiple errors report...	
measure_data		Error: Multiple errors report...	
temperatureC		Error: Multiple errors report...	
temperatureF		Error: Multiple errors report...	
humidityP		Error: Multiple errors report...	
err	ssp_err_t	SSP_SUCCESS	
buf	uint8_t [20]	0x1ffe2a74 <bmc150_threa...	0x1ffe2a74
buf[0]	uint8_t	0 '\0'	0x1ffe2a74
buf[1]	uint8_t	239 'i'	0x1ffe2a75
buf[2]	uint8_t	239 'i'	0x1ffe2a76
buf[3]	uint8_t	239 'i'	0x1ffe2a77
buf[4]	uint8_t	0 '\0'	0x1ffe2a78
buf[5]	uint8_t	0 '\0'	0x1ffe2a79
buf[6]	uint8_t	0 '\0'	0x1ffe2a7a
buf[7]	uint8_t	250 'u'	0x1ffe2a7b
buf[8]	uint8_t	235 'e'	0x1ffe2a7c
buf[9]	uint8_t	241 'h'	0x1ffe2a7d
buf[10]	uint8_t	254 'p'	0x1ffe2a7e
buf[11]	uint8_t	65 'A'	0x1ffe2a7f
buf[12]	uint8_t	62 '>'	0x1ffe2a80
buf[13]	uint8_t	0 '\0'	0x1ffe2a81
buf[14]	uint8_t	0 '\0'	0x1ffe2a82

Console:

```
50 //read chip id
51 buf[0] = 0x00;
52 00005010 err = g_sf_i2c_device0.p_api->write(g_sf_i2c_device0.p_ctrl, buf, 1, false, TX_WAIT_FOREVER);
53 0000501a if (err)
54 0000502a g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
55 000050be
56
57 0000502e err = g_sf_i2c_device0.p_api->read(g_sf_i2c_device0.p_ctrl, &buf[7], 1, false, TX_WAIT_FOREVER);
58 0000503e if (err)
59 000050b0 g_ioport.p_api->pinWrite(IOPORT_PORT_01_PIN_13, true);
60
```