

S5D9 ADS1015 I2C Bus Examples (Both IIC and SCI Drivers)

By
Michael Li
(3/2/2018)

<https://www.miketechuniverse.com>

E2 Studio 5.4.0.023
SSP 1.3.0

This is a set of examples that show how to add the ADC capability to the S5D9 IOT board.

This board has two grove headers. Grove B is an IIC port while grove A is an SCI port. You creates r_iic driver for the IIC port and r_sci_i2c for the SCI port.

6 examples are included in this tutorial.

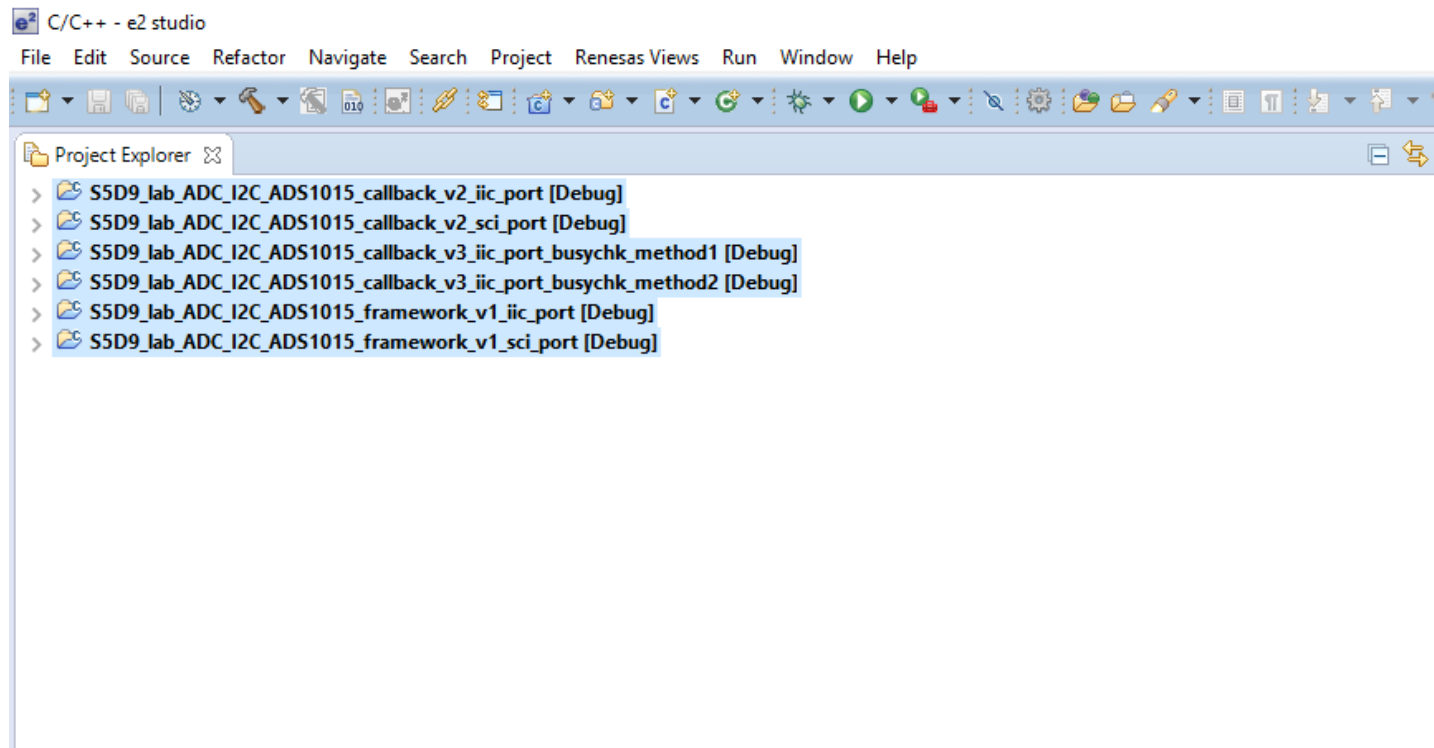
- Grove B / r_iic driver (only for the fast speed mode) *
- Grove B / framework with r_iic driver
- Grove A / r_sci_i2c driver
- Grove A / framework with r_sci_i2c driver

*Because r_iic has some issue for standard speed mode. Two possible workaround examples are included.

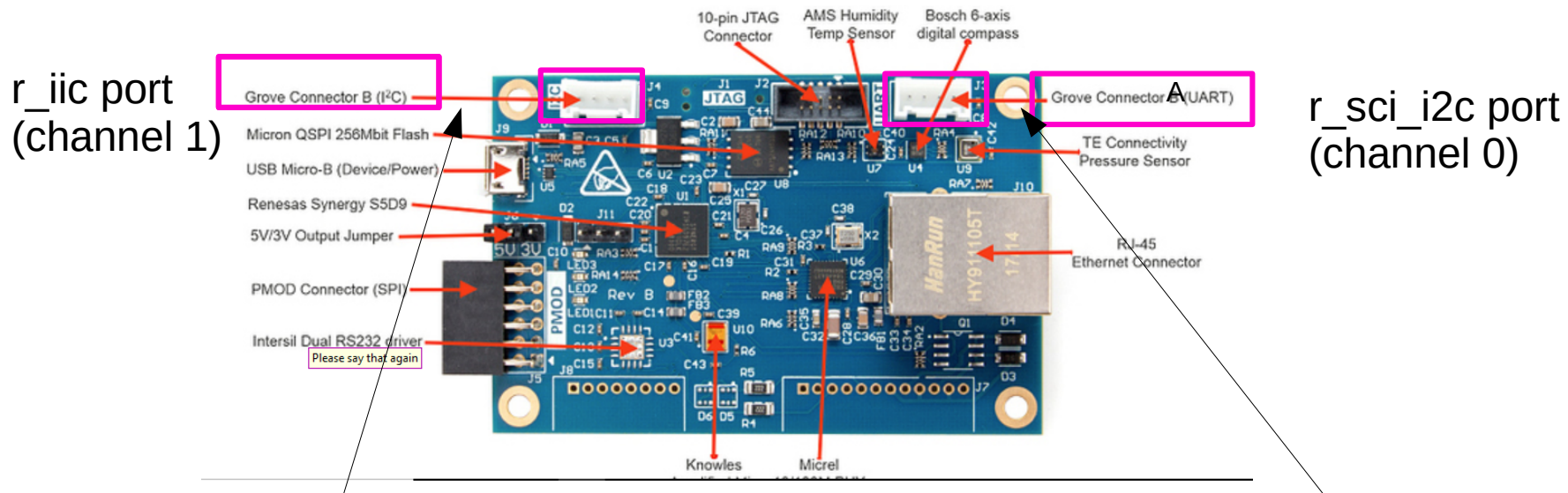
- Grove B / r_iic driver / method 1 with busy bit check
- Grove B / r_iic driver / method 2 with busy bit check

Both checks for the hardware busy bit before the code starts the next i2c transmission. The above examples are are done with limited testing. At this point, this ADC component seem to work well with these workaround solutions.

Project List



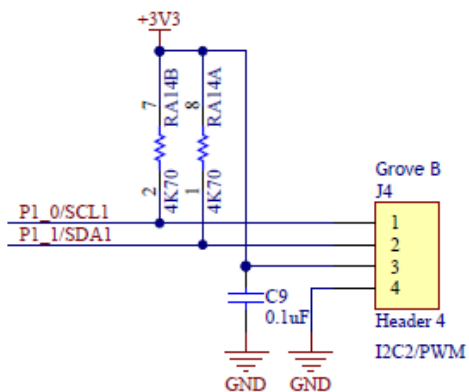
Two I2C Bus Ports' Location



I2C

Grove B J4 (P1_0/1)

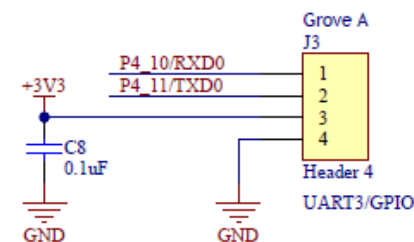
iic1 Driver



I2C

Grove A J3 (P4_10/11) sci0 Driver

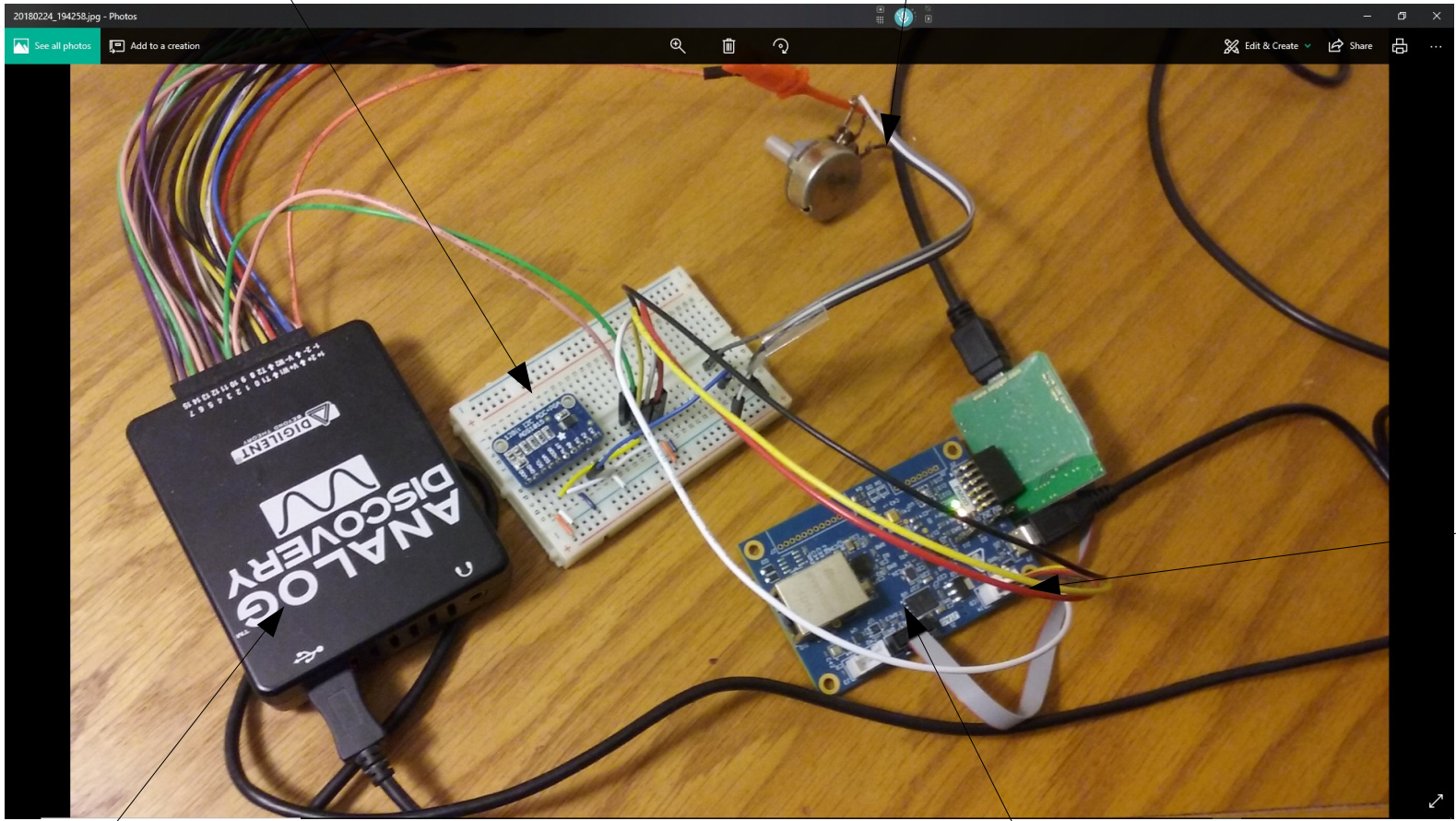
Need to add external 4.7K pull up resistors for P4_10/11



Reconfigure this port as I2C instead of UART port.

Adafruit TI ADS1015 ADC

Hardware setup I2C bus
(Grove B r_iic port)
(ADC part and Potentiometer)



Grove B r_iic port

Scope

S5D9 IOT board

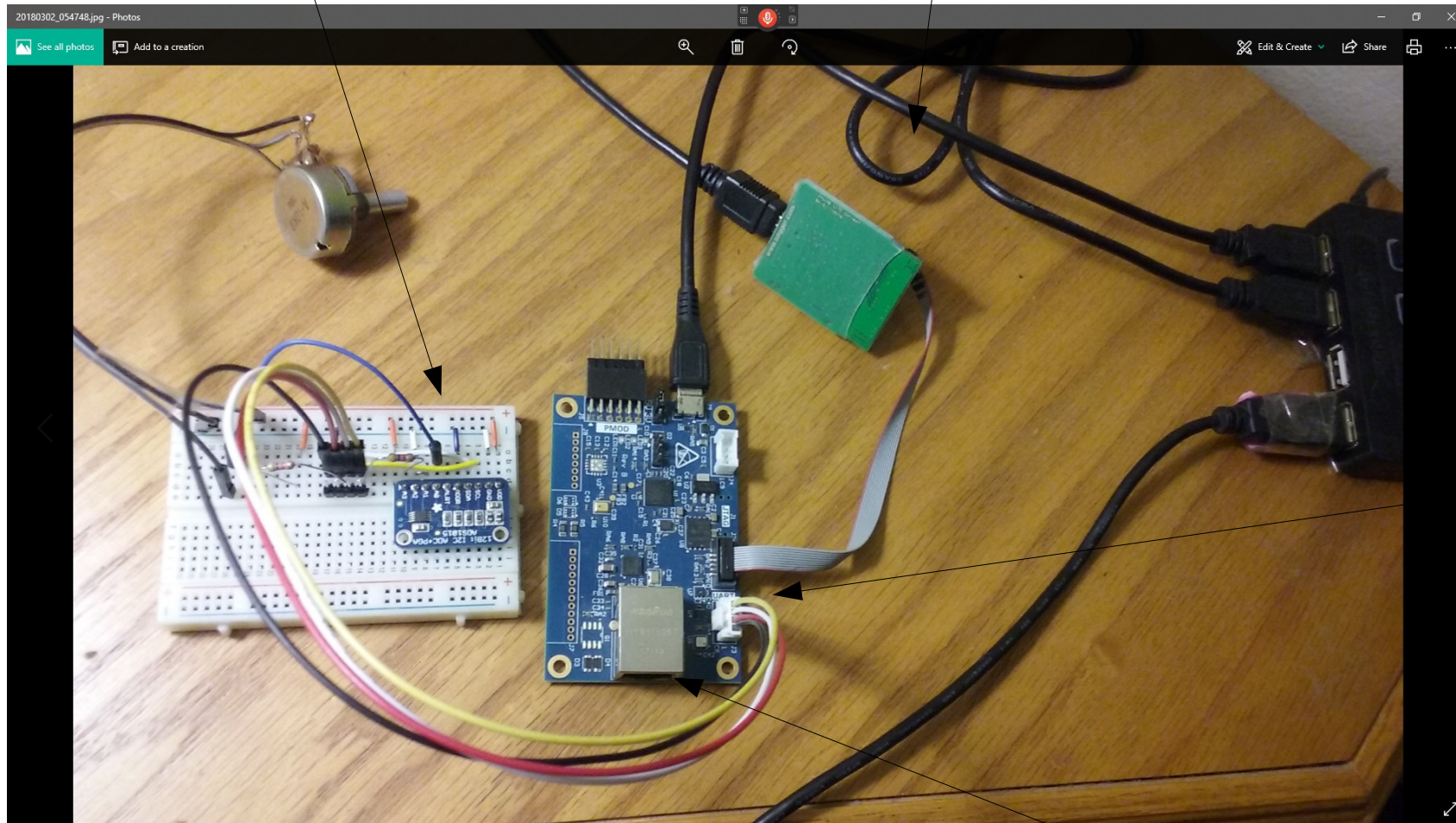
Adafruit TI ADS1015 ADC

Hardware setup I2C bus
(Grove A r_sci_i2c port)
(ADC part and Potentiometer)

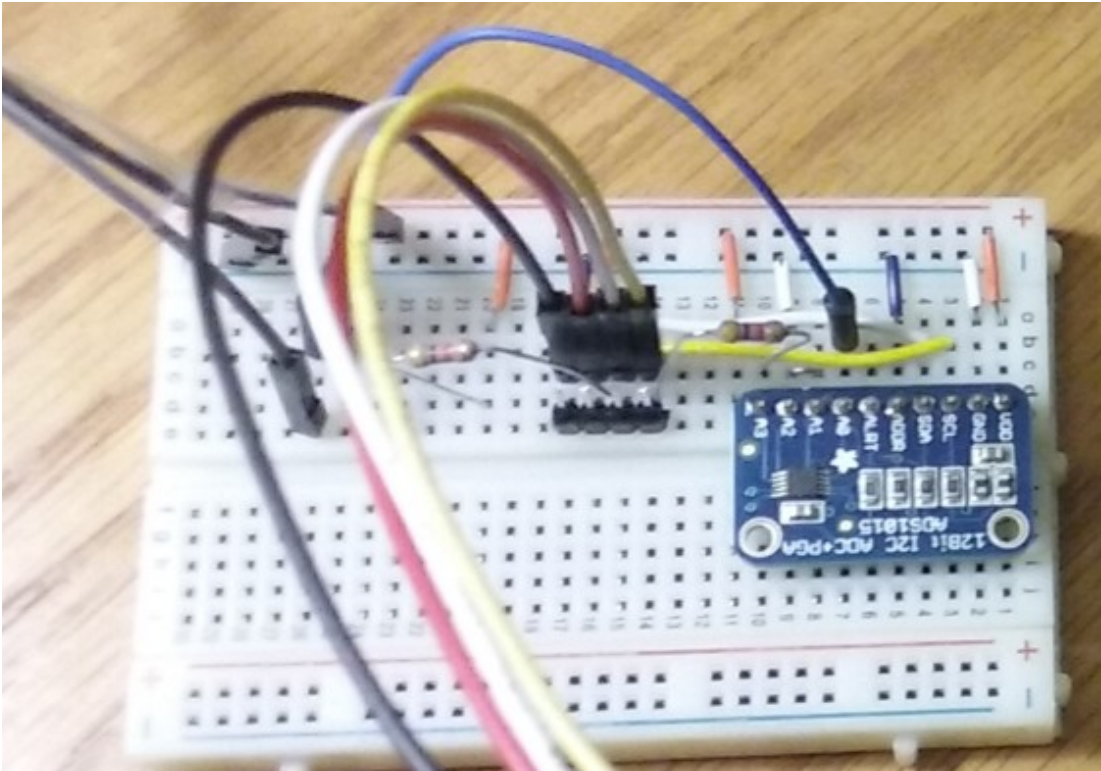
Grove B r_sci_i2c
port

S5D9 IOT board

Michael C. Li



ADC connection



VCC = VCC
GND = GND
SCL = SCL
SDA = SDA
ADDR = GND
ALRT = NC
A0 = Potentiometer
A1/2/3 = GND (not used)

ADC Slave Address

I²C ADDRESS SELECTION

The ADS1013/4/5 have one address pin, ADDR, that sets the I²C address. This pin can be connected to ground, VDD, SDA, or SCL, allowing four addresses to be selected with one pin as shown in Table 5. The state of the address pin ADDR is sampled continuously.

Table 5. ADDR Pin Connection and Corresponding Slave Address

ADDR PIN	SLAVE ADDRESS
Ground	1001000
VDD	1001001
SDA	1001010
SCL	1001011

Example: Configuration Register Read

Step 1: Slave address (48h) + w → Register address (01h)

Step 2: Slave address (48h) + r → 2 bytes of data read (8583h)

Example: Configuration Register Write and initiate one shot ADC conversion.

Step 1: Slave address (48h) + w → Register address (01h) + 2 bytes of data write (C383h)

POINTER REGISTER

The four registers are accessed by writing to the Pointer register byte; see Figure 16. Table 6 and Table 7 indicate the Pointer register byte map.

Table 6. Register Address

BIT 1	BIT 0	REGISTER
0	0	Conversion register
0	1	Config register
1	0	Lo_thresh register
1	1	Hi_thresh register

Table 8. Conversion Register (Read-Only)

BIT	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
NAME	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0	0	0	0	0

$$\text{Voltage level} = D[11:0] / 2048 \times 4.096\text{V} \quad (\text{using } \pm 4096 \text{ FSR})$$

Example: Conversion Register Read

Step 1: Slave address (48h) + w → Register address (00h)

Step 2: Slave address (48h) + r → 2 bytes of data read (16 bits)

Default = 8583h (Config Register)

Table 9. Config Register (Read/Write)

BIT	15	14	13	12	11	10	9	8
NAME	OS	MUX2	MUX1	MUX0	PGA2	PGA1	PGA0	MODE
BIT	7	6	5	4	3	2	1	0
NAME	DR2	DR1	DR0	COMP_MODE	COMP_POL	COMP_LAT	COMP_QUE1	COMP_QUE0

Default = 8583h.

Bit [15]

OS: Operational status/single-shot conversion start

This bit determines the operational status of the device.
This bit can only be written when in power-down mode.

For a write status:

0 : No effect

1 : Begin a single conversion (when in power-down mode)

For a read status:

0 : Device is currently performing a conversion

1 : Device is not currently performing a conversion

IIC Channel 1

The screenshot displays the Synergy Configuration interface for the 'Pins' section. The top bar shows the project name '[SSD9_Lab_ADC_I2C_ADS1015_v1]' and the 'Synergy Configuration' tab. The 'Pins' tab is active, and the 'Generate Project Content' button is visible in the top right.

Select pin configuration: A dropdown menu shows 'SSD9-IOT-Enabler.pincfg' selected. A checkbox labeled 'Generate data:' is checked, with a text field containing 'g_bsp_pin_cfg'.

Pin Selection: A tree view on the left lists various peripherals. Under 'Connectivity:IIC', 'IIC1' is selected and highlighted in blue. Other options include IIC0, IIC2, and various other connectivity and input/output modules.

Pin Configuration: The right panel shows the configuration for the selected module, 'IIC1'.
- **Module name:** IIC1
- **Usage:** For IIC, use same Pin Group for SDA/SCL signals -Please refer to the MCU User's Manual.
- **Pin Group Selection:** A dropdown menu showing '_B only'.
- **Operation Mode:** A dropdown menu showing 'Enabled'.
- **Input/Output:** A section with two rows:
 - **SDA:** A dropdown menu showing 'P101' with a green checkmark and a right-pointing arrow button.
 - **SCL:** A dropdown menu showing 'P100' with a green checkmark and a right-pointing arrow button.

The bottom of the interface features a tabbed navigation bar with the following tabs: Summary, BSP, Clocks, Pins, Threads, Messaging, ICU, and Components. The 'Pins' tab is currently selected.

SCI Channel 0

PINS Generate Project Content

Select pin configuration

SSD9-IOT-Enabler.pincfg ☒ Generate data: g_bsp_pin_cfg

Pin Selection

type filter text

- ✓ Peripherals
 - > Monitoring: CAC
 - ✓ Analog: ADC
 - > Analog: CMP
 - > Analog: DAC12
 - > Connectivity: CAN
 - ✓ Connectivity: ETHERC
 - ✓ Connectivity: IIC
 - ✓ Connectivity: SCI
 - ✓ **SCI0**
 - SCI1
 - SCI2
 - ✓ SCI3
 - SCI4
 - SCI5
 - SCI6
 - ✓ SCI7
 - SCI8
 - SCI9
 - > ✓ Connectivity: SPI
 - > Connectivity: SSI

Pin Configuration

Module name: SCI0

Usage: When using Simple I2C mode, ensure port pins output type is n-ch open drain. When switching between I2C and other modes, first disable.

Pin Group Selection: _B only

Operation Mode: Simple I2C

Input/Output

TXD_MOSI:	None	
RXD_MISO:	None	
SCK:	None	
CTS_RTSS_SS:	None	
SDA:	✓ P411	
SCL:	✓ P410	

r_iic driver

C/C++ - SSD9_lab_ADC_I2C_ADS1015_callback_v2_iic_port/configuration.xml - e2 studio

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

Project Explorer

- SSD9_I2C_INT_ENV210_OLED_SHT31_v1
- SSD9_I2C_INT_ENV210_OLED_SHT31_v1b
- SSD9_I2C_OLED_SHT31_2bus_TX_v1
- SSD9_I2C_OLED_SHT31_TX_v2
- SSD9_I2C_OLED_SHT31_TX_v3
- SSD9_I2C_OLED_SHT31_TX_v4
- SSD9_I2C_OLED_SHT31_TX_v4b
- SSD9_I2C_OLED_SHT31_TX_v4c
- SSD9_I2C_OLED_TX_v1
- SSD9_I2C_Sensor_Lab
- SSD9_I2C_Sensor_Lab_Framework
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v1
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v2
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3a
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3b
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3c
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v4
- SSD9_I2C_SHT31_TO_BMC_TX_UARTBUS_v1
- SSD9_I2C_SHT31_TX_UARTBUS_v1
- SSD9_I2C_without_Tx
- SSD9_IOT_APP_LOADER
- SSD9_lab_ADC_I2C_ADS1015_callback_v1
- SSD9_lab_ADC_I2C_ADS1015_callback_v2
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_iic_port
 - Binaries
 - Includes
 - src
 - synergy
 - Debug
 - script
 - synergy_cfg
 - configuration.xml
 - R7FSSD97E2A01CLK.pincfg
 - SSD9_lab_ADC_I2C_ADS1015_callback_v1 Debug.jlink
 - SSD9_lab_ADC_I2C_ADS1015_callback_v2 Debug.jlink
 - SSD9_lab_ADC_I2C_ADS1015_callback_v2_iic_port Debug.launch
 - SSD9-IOT-Enabler.pincfg
 - synergy_cfg.txt
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_sci_port
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_ssp133
- SSD9_lab_ADC_I2C_ADS1015_callback_v3
- SSD9_lab_ADC_I2C_ADS1015_callback_v3_iic_port_busychk_method1
- SSD9_lab_ADC_I2C_ADS1015_callback_v3_iic_port_busychk_method2
- SSD9_lab_ADC_I2C_ADS1015_callback_v3_method2
- SSD9_lab_ADC_I2C_ADS1015_framework_v1
- SSD9_lab_ADC_I2C_ADS1015_framework_v1_iic_port
- SSD9_lab_ADC_I2C_ADS1015_framework_v1_sci_port
 - Binaries
 - Includes
 - src

Threads

HAL/Common

- g_cgc CGC Driver on r_cgc
- g_fmi FMI Driver on r_fmi
- g_elc ELC Driver on r_elc

HAL/Common Objects

HAL/Common Stacks

- g_fmi FMI Driver on r_fmi
- g_elc ELC Driver on r_elc
- g_ioport I/O Port Driver on r_ioport
- g_ads1015 I2C Master Driver on r_iic
 - g_transfer0 Transfer Driver on r_dtc Event IIC1 TXI
 - g_transfer1 Transfer Driver on r_dtc Event IIC1 RXI

Summary BSP Clocks Pins Threads Messaging ICU Components

Problems Tasks Console Properties Memory Usage Smart Browser Include Browser Debug RTOS Resources

g_ads1015 I2C Master Driver on r_iic

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_ads1015 I2C Master Driver on r_iic	
Name	g_ads1015
Channel	1
Rate	Fast-mode
Slave Address	0x48
Address Mode	7-Bit
Callback	g_ads1015_callback
Receive Interrupt Priority	Priority 2
Transmit Interrupt Priority	Priority 2
Transmit End Interrupt Priority	Priority 2
Error Interrupt Priority	Priority 2

Connect Mylyn

Connect to your t
ALM tools or crea
local task.

r_sci_i2c driver

C/C++ - SSD9_lab_ADC_I2C_ADS1015_callback_v2_sci_port/configuration.xml - e2 studio

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

Project Explorer

- SSD9_I2C_ENV210_OLED_SHT31_v3c_Framework
- SSD9_I2C_EXT_OLED_v1
- SSD9_I2C_EXT_OLED_v2
- SSD9_I2C_EXT_SHT31
- SSD9_I2C_EXT_SHT31_1
- SSD9_I2C_EXT_SHT31_without_Tx
- SSD9_I2C_INT_ENV210_v1
- SSD9_I2C_INT_ENV210_OLED
- SSD9_I2C_INT_ENV210_OLED_SHT31
- SSD9_I2C_INT_ENV210_OLED_SHT31_v1
- SSD9_I2C_INT_ENV210_OLED_SHT31_v1b
- SSD9_I2C_OLED_SHT31_2bus_TX_v1
- SSD9_I2C_OLED_SHT31_TX_v2
- SSD9_I2C_OLED_SHT31_TX_v3
- SSD9_I2C_OLED_SHT31_TX_v4
- SSD9_I2C_OLED_SHT31_TX_v4b
- SSD9_I2C_OLED_SHT31_TX_v4c
- SSD9_I2C_OLED_TX_v1
- SSD9_I2C_Sensor_Lab
- SSD9_I2C_Sensor_Lab_Framework
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v1
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v2
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3a
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3b
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3c
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v4
- SSD9_I2C_SHT31_TO_BMC_TX_UARTBUS_v1
- SSD9_I2C_SHT31_TX_UARTBUS_v1
- SSD9_I2C_without_Tx
- SSD9_IOT_APP_LOADER
- SSD9_lab_ADC_I2C_ADS1015_callback_v1
- SSD9_lab_ADC_I2C_ADS1015_callback_v2
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_iic_port
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_sci_port
 - Binaries
 - Includes
 - src
 - synergy
 - Debug
 - script
 - synergy_cfg
 - configuration.xml
 - R7F5SD97E2A01CLK.pincfg
 - SSD9_lab_ADC_I2C_ADS1015_callback_v1 Debug.jlink
 - SSD9_lab_ADC_I2C_ADS1015_callback_v2 Debug.jlink
 - SSD9_lab_ADC_I2C_ADS1015_callback_v2_sci_port Debug.jlink
 - SSD9_lab_ADC_I2C_ADS1015_callback_v2_sci_port Debug.launch
 - SSD9-IOT-Enabler.pincfg
 - synergy_cfg.txt
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_ssp133

Threads

HAL/Common Stacks

HAL/Common Objects

Summary | BSP | Clocks | Pins | Threads | Messaging | ICU | Components

g_ads1015 I2C Master Driver on r_sci_i2c

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_ads1015 I2C Master Driver on r_sci_i2c	
Name	g_ads1015
Channel	0
Rate	Fast-mode
Slave Address	0x48
Address Mode	7-Bit
SDA Output Delay (nano seconds)	300
Bit Rate Modulation Enable	Enable
Callback	g_ads1015_callback
Receive Interrupt Priority	Priority 2
Transmit Interrupt Priority	Priority 2

Connect Mylyn

Connect to your t
ALM tools or crea
local task.

Framework with the r_iic driver configuration

The screenshot displays the e2 studio IDE interface for configuring the r_iic driver. The top menu bar includes File, Edit, Source, Refactor, Navigate, Search, Project, Renesas Views, Run, Window, and Help. The toolbar contains various icons for file operations, navigation, and execution.

Project Explorer: The left sidebar shows a project tree with the following structure:

- SSD9_I2C_EXT_SHT31
- SSD9_I2C_EXT_SHT31_1
- SSD9_I2C_EXT_SHT31_without_Tx
- SSD9_I2C_INT_ENV210_v1
- SSD9_I2C_INT_ENV210_OLED
- SSD9_I2C_INT_ENV210_OLED_SHT31
- SSD9_I2C_INT_ENV210_OLED_SHT31_v1
- SSD9_I2C_INT_ENV210_OLED_SHT31_v1b
- SSD9_I2C_OLED_SHT31_2bus_TX_v1
- SSD9_I2C_OLED_SHT31_TX_v2
- SSD9_I2C_OLED_SHT31_TX_v3
- SSD9_I2C_OLED_SHT31_TX_v4
- SSD9_I2C_OLED_SHT31_TX_v4b
- SSD9_I2C_OLED_SHT31_TX_v4c
- SSD9_I2C_OLED_TX_v1
- SSD9_I2C_Sensor_Lab
- SSD9_I2C_Sensor_Lab_Framework
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v1
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v2
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3a
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3b
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v3c
- SSD9_I2C_SHT31_OLED_TX_UARTBUS_v4
- SSD9_I2C_SHT31_TO_BMC_TX_UARTBUS_v1
- SSD9_I2C_SHT31_TX_UARTBUS_v1
- SSD9_I2C_without_Tx
- SSD9_IOT_APP_LOADER
- SSD9_lab_ADC_I2C_ADS1015_callback_v1
- SSD9_lab_ADC_I2C_ADS1015_callback_v2
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_iic_port
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_sci_port
- SSD9_lab_ADC_I2C_ADS1015_callback_v2_ssp133
- SSD9_lab_ADC_I2C_ADS1015_callback_v3
- SSD9_lab_ADC_I2C_ADS1015_callback_v3_iic_port_busychk_method1
- SSD9_lab_ADC_I2C_ADS1015_callback_v3_iic_port_busychk_method2
- SSD9_lab_ADC_I2C_ADS1015_callback_v3_method2
- SSD9_lab_ADC_I2C_ADS1015_framework_v1
- SSD9_lab_ADC_I2C_ADS1015_framework_v1_iic_port [Debug]**
 - Binaries
 - Includes
 - src
 - synergy_gen
 - ads1015_thread_entry.c
 - hal_entry.c
 - synergy
 - Debug
 - script
 - synergy_cfg
 - configuration.xml
 - R7FS5D97E2A01CLK.pinconf
 - SSD9_lab_ADC_I2C_ADS1015_callback_v1

Threads: The central workspace shows the 'Threads' view with the following threads:

- HAL/Common
 - g_ioport I/O Port Driver on r_ioport
 - g_fmi FMI Driver on r_fmi
 - g_cgc CGC Driver on r_cgc ...
- ADS1015 Thread
 - g_ads1015 I2C Framework Device on sf_i2c

ADS1015 Thread Objects: The 'ADS1015 Thread Objects' view shows the following objects:

- g_sf_i2c_bus0 I2C Framework Shared Bus on sf_i2c
- g_i2c0 I2C Master Driver on r_iic
- g_transfer0 Transfer Driver on r_dtc Event IIC1 TXI
- g_transfer1 Transfer Driver on r_dtc Event IIC1 RXI

Properties: The bottom right pane shows the 'Properties' view for the 'g_i2c0 I2C Master Driver on r_iic' component. The 'Settings' tab is active, displaying the following properties:

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_i2c0 I2C Master Driver on r_iic	
Name	g_i2c0
Channel	1
Rate	Fast-mode
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

Framework with the r_sci_i2c driver configuration

The screenshot displays the Synergy Configuration tool interface. The top menu bar includes File, Edit, Source, Refactor, Navigate, Search, Project, Renesas Views, Run, Window, and Help. The Project Explorer on the left shows a project structure with various source files and folders, including `SSD9_I2C_INT_ENV210_OLED_SHT31_v1`, `SSD9_I2C_OLED_SHT31_2bus_TX_v1`, and `SSD9_I2C_Sensor_Lab`. The main workspace is divided into several panes:

- Threads:** Lists threads such as `HAL/Common`, `g_ioport I/O Port Driver on r_ioport`, `g_fmi FMI Driver on r_fmi`, `g_cgc CGC Driver on r_cgc ...`, and `ADS1015 Thread`.
- ADS1015 Thread Stacks:** A diagram showing the stack of components for the `g_ads1015 I2C Framework Device on sf_i2c`, including `g_sf_i2c_bus1 I2C Framework Shared Bus on sf_i2c` and `g_i2c0 I2C Master Driver on r_sci_i2c`.
- ADS1015 Thread Objects:** A diagram showing the objects for the `g_i2c0 I2C Master Driver on r_sci_i2c`, including `g_transfer2 Transfer Driver on r_dtc Event SCIO TXI` and `g_transfer3 Transfer Driver on r_dtc Event SCIO RXI`.
- g_i2c0 I2C Master Driver on r_sci_i2c:** A detailed configuration table for the driver.

The configuration table for the `g_i2c0 I2C Master Driver on r_sci_i2c` is as follows:

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_i2c0 I2C Master Driver on r_sci_i2c	
Name	g_i2c0
Channel	0
Rate	Fast-mode
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
Transmit End Interrupt Priority	Priority 2

Configuration Register read

Buf[0] = 85h and Buf[1] = 83h

The screenshot displays the e2 studio IDE during a debug session. The main window shows the source code of `hal_entry.c` with a `while` loop that reads the configuration register. The `buf` array is used to store the read values. The `Variables` window on the right shows the current state of the `buf` array, with `buf[0]` at 133 (85h) and `buf[1]` at 131 (83h). The `Console` window at the bottom shows the program is suspended at `main.c:5` in the `hal_entry()` function.

Name	Type	Value
buf	uint8_t [20]	0x1ffe2364 <g_main_stack+4036>
buf[0]	uint8_t	133
buf[1]	uint8_t	131
buf[2]	uint8_t	0
buf[3]	uint8_t	0
buf[4]	uint8_t	0
buf[5]	uint8_t	16
buf[6]	uint8_t	4
buf[7]	uint8_t	64
buf[8]	uint8_t	1
buf[9]	uint8_t	0
buf[10]	uint8_t	3
buf[11]	uint8_t	0
buf[12]	uint8_t	0
buf[13]	uint8_t	1
buf[14]	uint8_t	0
buf[15]	uint8_t	0
buf[16]	uint8_t	254
buf[17]	uint8_t	15
buf[18]	uint8_t	0
buf[19]	uint8_t	0
err	ssp_err_t	SSP_SUCCESS

```
26 00004ab8      while (1);
27
28
29
30      while (1) {
31          // read configuration register
32          buf[0] = ADS1015_CONFIGREG_ADDR;
33          err = g_ads1015.p_api->write(g_ads1015.p_ctrl, buf, 1, false);
34          if (SSP_SUCCESS != err) {
35              g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
36              while (1);
37          }
38          err = g_ads1015.p_api->read(g_ads1015.p_ctrl, buf, 2, false);
39          if (SSP_SUCCESS != err) {
40              g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
41              while (1);
42          }
43      }
44  }
```

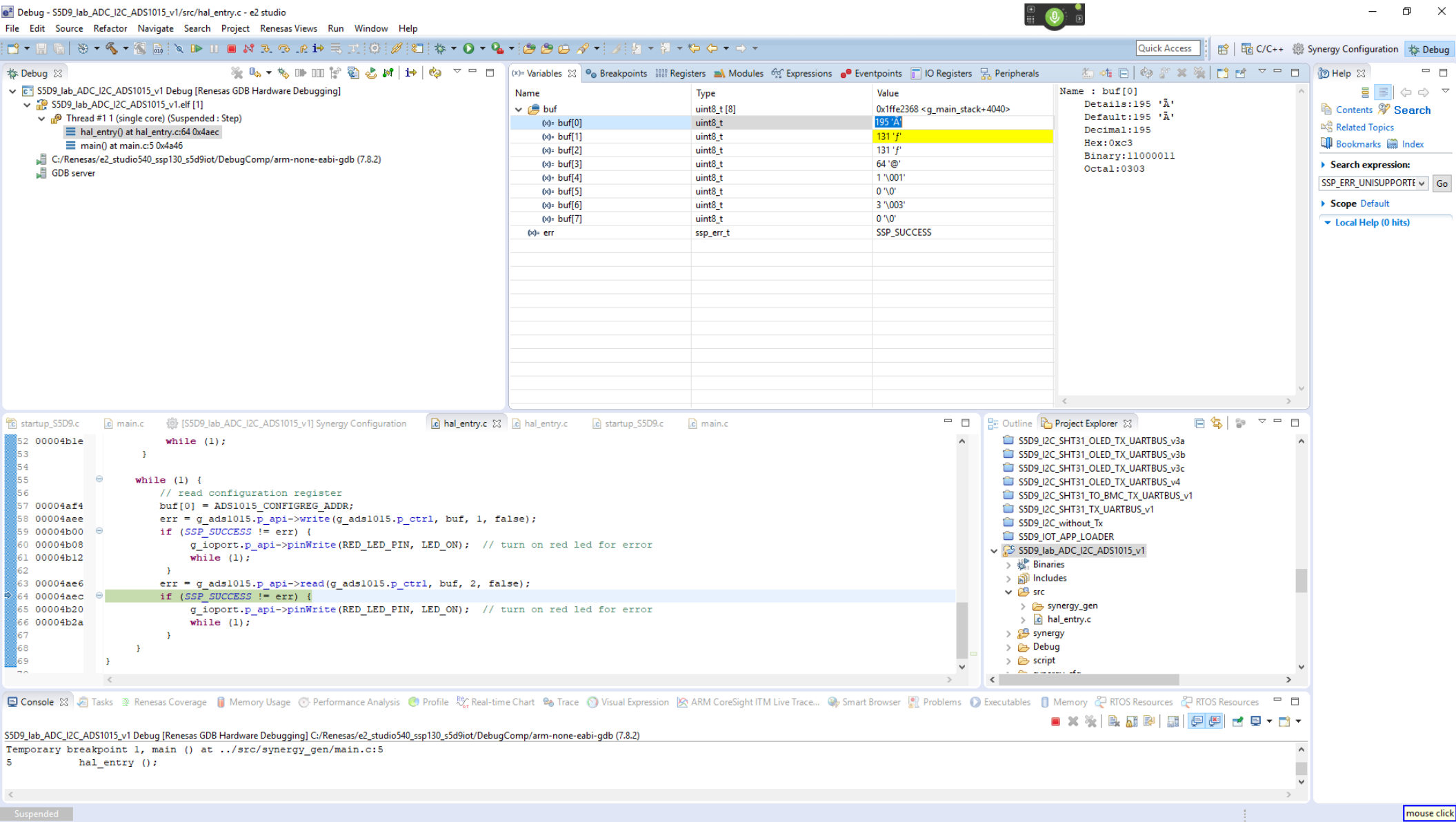
Console: SSP_SUCCESS

Temporary breakpoint 1, main () at ../src/synergy_gen/main.c:5

5 hal_entry ();

Configuration Register write/read

Buf[0] = C3h and Buf[1] = 83h



Debug - S5D9_lab_ADC_I2C_ADS1015_v1/src/hal_entry.c - e2 studio

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

Quick Access C/C++ Synergy Configuration Debug

Debug S5D9_lab_ADC_I2C_ADS1015_v1 Debug [Renesas GDB Hardware Debugging]

S5D9_lab_ADC_I2C_ADS1015_v1.elf [1]

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

hal_entry() at hal_entry.c:64 0x4aec

main() at main.c:5 0x4a46

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

GDB server

Variables

Name	Type	Value
buf	uint8_t [8]	0x1ffe2368 <g_main_stack+4040>
buf[0]	uint8_t	195 'A'
buf[1]	uint8_t	131 'f'
buf[2]	uint8_t	131 'f'
buf[3]	uint8_t	64 '@'
buf[4]	uint8_t	1 '\001'
buf[5]	uint8_t	0 '\0'
buf[6]	uint8_t	3 '\003'
buf[7]	uint8_t	0 '\0'
err	ssp_err_t	SSP_SUCCESS

Name : buf[0]
Details: 195 'A'
Default: 195 'A'
Decimal: 195
Hex: 0xc3
Binary: 11000011
Octal: 0303

Search expression: SSP_ERR_UNISUPPORTE Go

Scope Default

Local Help (0 hits)

startup_S5D9.c main.c [S5D9_lab_ADC_I2C_ADS1015_v1] Synergy Configuration hal_entry.c hal_entry.c startup_S5D9.c main.c

```
52 00004b1e while (1);
53
54
55
56 while (1) {
57 // read configuration register
58 buf[0] = ADS1015_CONFIGREG_ADDR;
59 err = g_ads1015.p_api->write(g_ads1015.p_ctrl, buf, 1, false);
60 if (SSP_SUCCESS != err) {
61 g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
62 while (1);
63 }
64 err = g_ads1015.p_api->read(g_ads1015.p_ctrl, buf, 2, false);
65 if (SSP_SUCCESS != err) {
66 g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
67 while (1);
68 }
69 }
```

Outline Project Explorer

- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3a
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3b
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3c
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v4
- S5D9_I2C_SHT31_TO_BMC_TX_UARTBUS_v1
- S5D9_I2C_SHT31_TX_UARTBUS_v1
- S5D9_I2C_without_Tx
- S5D9_IOT_APP_LOADER
- S5D9_lab_ADC_I2C_ADS1015_v1
 - Binaries
 - Includes
 - src
 - synergy_gen
 - hal_entry.c
 - synergy
 - Debug
 - script

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

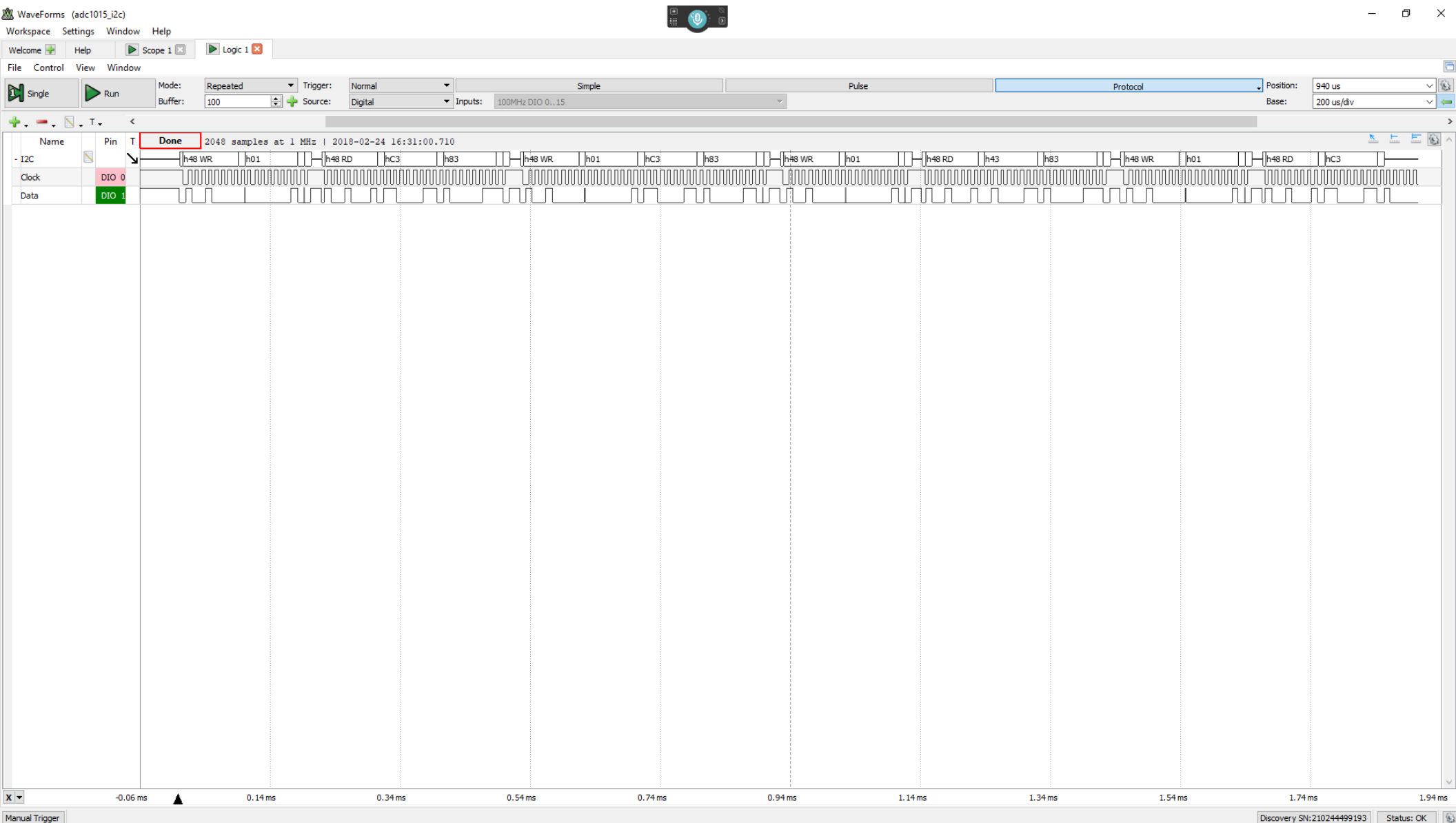
S5D9_lab_ADC_I2C_ADS1015_v1 Debug [Renesas GDB Hardware Debugging] C:/Renesas/e2_studio540_ssp130_s5d9iot/DebugComp/arm-none-eabi-gdb (7.8.2)

Temporary breakpoint 1, main () at ../src/synergy_gen/main.c:5

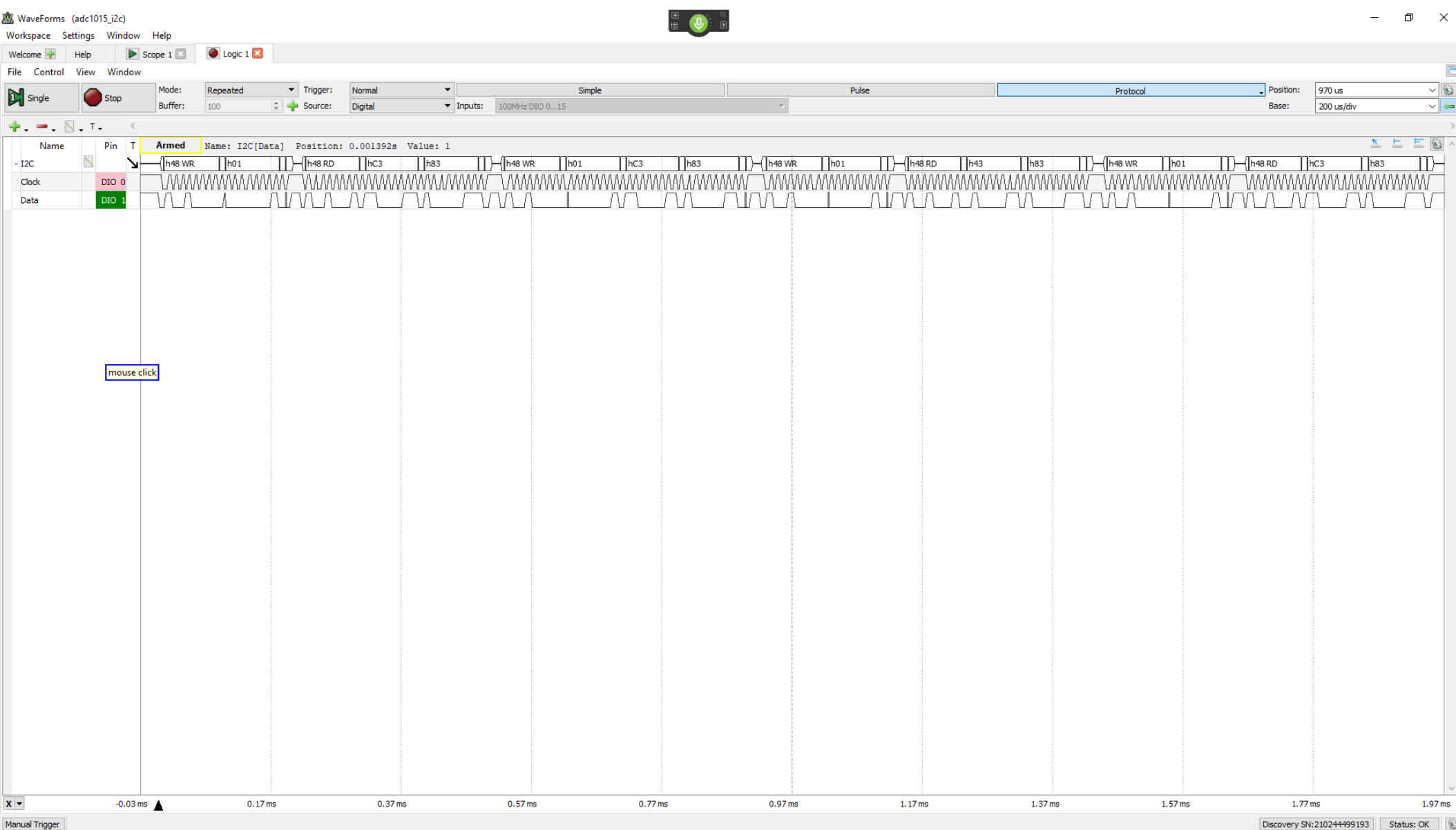
```
5 hal_entry ();
```

Suspended mouse click

C3 (1100_0011) → 43 (0100_0011) good
WR OS bit → RD OS bit (0=busy)



Stop when OS bit = 1



0x4450 → 0x445 or 1093
 $1093 / 2048 \times 4.096 = 2.186V$
 FSR +/- 4.096 and only positive side use 2048

Debug - S5D9_I2C_ADC_I2C_ADS1015_v3/src/hal_entry.c - e2 studio

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

Variables

Expression	Type	Value	Address
distance		Error: Multiple errors reported.\ Failed to exe...	
g_time_start_flag		Error: Multiple errors reported.\ Failed to exe...	
g_time_end_flag		Error: Multiple errors reported.\ Failed to exe...	
g_echo_start_time		Error: Multiple errors reported.\ Failed to exe...	
g_echo_end_time		Error: Multiple errors reported.\ Failed to exe...	
(*) convdata	uint16_t	1093	0x1ffe03a8
(*) ain_level	float	2.18600011	0x1ffe03a4
Add new expression			

hal_entry.c

```

101 000086a8      g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
102 000086b6      while (1);
103
104 000086b8      if (buf[0] & 0x80) {
105 000086c2          g_ioport.p_api->pinWrite(YEL_LED_PIN, LED_ON); // turn on red led for error
106
107 000086d0          buf[0] = ADS1015_CONVERSION_ADDR;
108 000086d4          err = g_ads1015.p_api->write(g_ads1015.p_ctrl, buf, 1, false);
109 000086ec          if (SSP_SUCCESS != err) {
110 000086f2              g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
111 00008700              while (1);
112
113 00008702          err = g_ads1015.p_api->read(g_ads1015.p_ctrl, buf, 2, false);
114 0000871a          if (SSP_SUCCESS != err) {
115 00008720              g_ioport.p_api->pinWrite(RED_LED_PIN, LED_ON); // turn on red led for error
116 0000872e              while (1);
117
118              // convdata[11:0] = buf[0:1] >> 4
119              convdata = buf[0];
120              convdata = convdata << 8;
121              convdata = convdata + (uint16_t) buf[1];
122              convdata = convdata >> 4;
123              ain_level = (float) convdata * 4.096 / 2048; // FSR = +/-4.096... For positive voltage range, only 2048 steps.
124              while (1);
125          }
126      }
127
128  }
129

```

Console

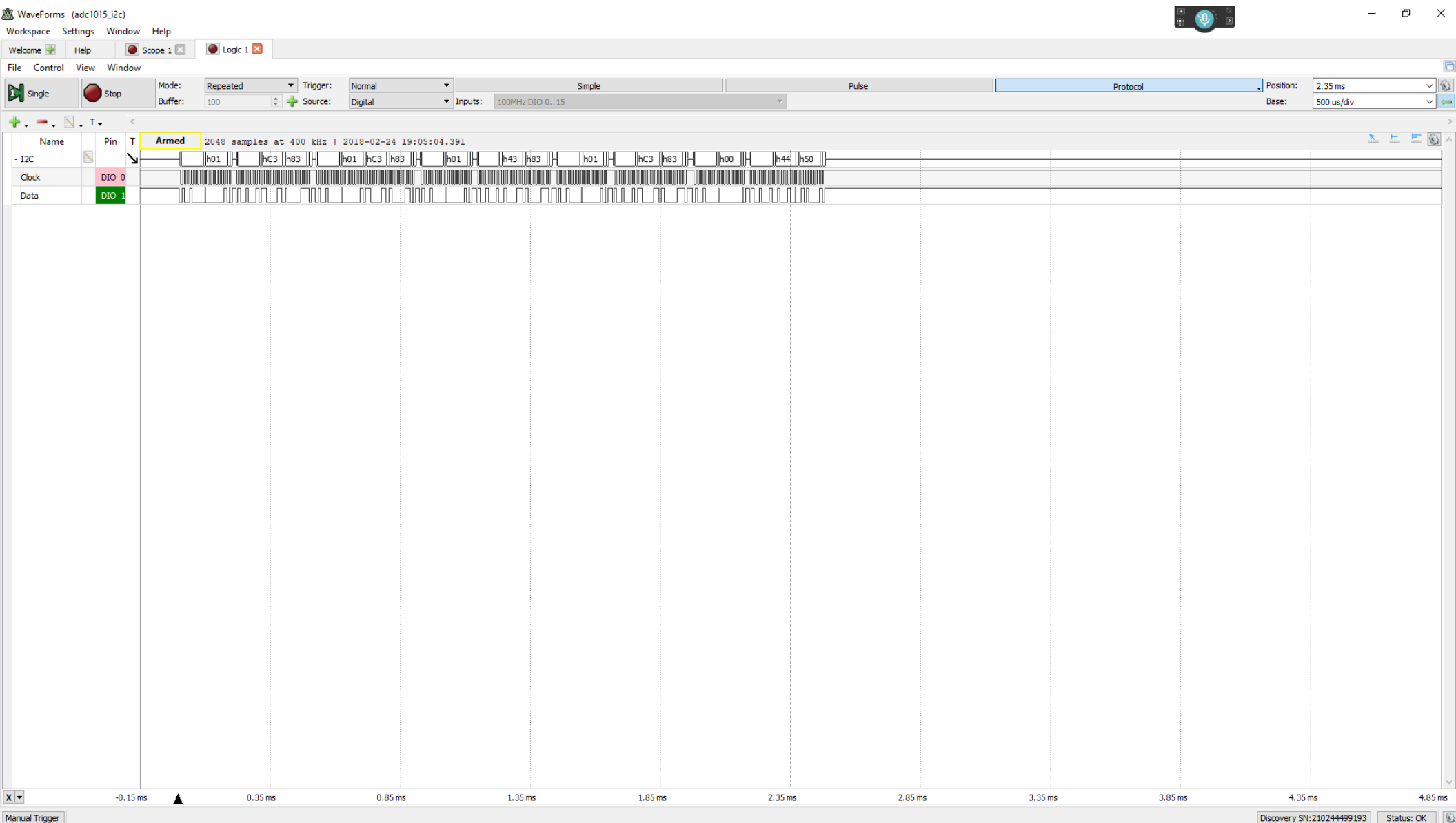
```

S5D9_I2C_ADC_I2C_ADS1015_v3 Debug [Renesas GDB Hardware Debugging] C:/Renesas/e2_studio540_ssp130_s5d9iot/DebugComp/arm-none-eabi-gdb (7.8.2)
hal_entry () at ../src/hal_entry.c:124
124      while (1);

```

Outline

- S5D9_I2C_OLED_SHT31_TX_v2
- S5D9_I2C_OLED_SHT31_TX_v3
- S5D9_I2C_OLED_SHT31_TX_v4
- S5D9_I2C_OLED_SHT31_TX_v4b
- S5D9_I2C_OLED_SHT31_TX_v4c
- S5D9_I2C_OLED_TX_v1
- S5D9_I2C_Sensor_Lab
- S5D9_I2C_Sensor_Lab_Framework
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v1
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v2
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3a
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3b
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v3c
- S5D9_I2C_SHT31_OLED_TX_UARTBUS_v4
- S5D9_I2C_SHT31_TO_BMC_TX_UARTBUS_v1
- S5D9_I2C_SHT31_TX_UARTBUS_v1
- S5D9_I2C_without_Tx
- S5D9_IOT_APP_LOADER
- S5D9_I2C_ADC_I2C_ADS1015_v1
- S5D9_I2C_ADC_I2C_ADS1015_v2
- S5D9_I2C_ADC_I2C_ADS1015_v3
- S5D9_I2C_ADC_I2C_ADS1015_v3
 - Binaries
 - Includes
 - src
 - synergy_gen
 - common_data.c
 - common_data.h



0.379 Khz (fast mode)

