

S5D9 Lab ADC MIC

By

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<https://www.miketechuniverse.com>

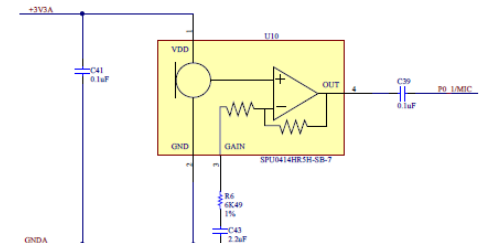
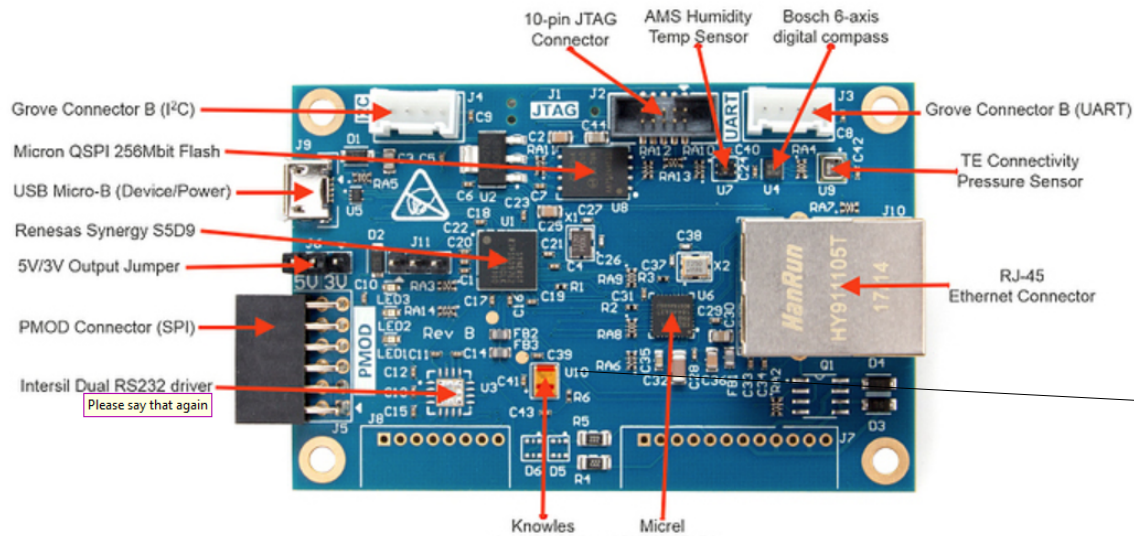
E2 Studio 5.4.0.023
SSP 1.3.0

P0_1 ADC0

ADC input is connected to the on board microphone.
This example will read from ADC to interpret the sound loudness level.

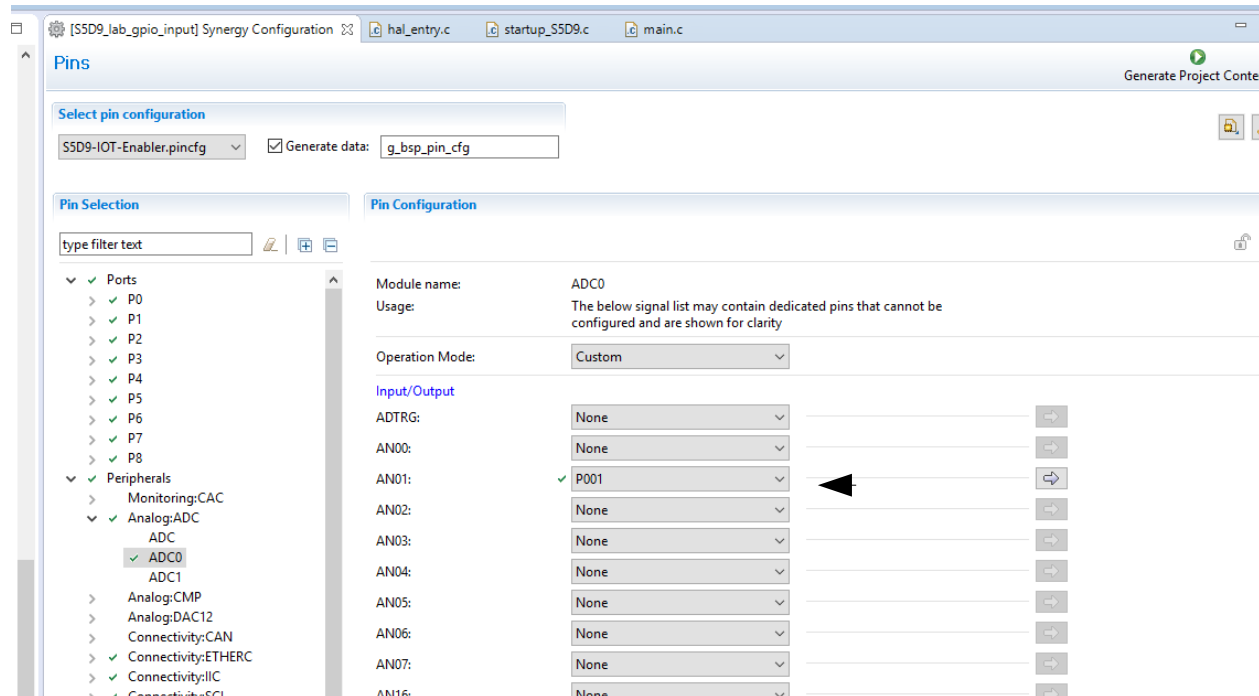
Renesas Synergy Platform S5D9 IoT Fast Prototyping Kit ([product page 2](#))

- Synergy S5D9 MCU with ARM CM4F @120MHz, 2M Flash and 640KB SDRAM
- External 256Mbits serial Nor QSPI flash for extra data and application storage
- Integrated acoustic, motion, pressure, temperature and humidity sensors
- 10/100Base-T Ethernet port for wireline connectivity to cloud
- USB 2.0 full speed as device and 5V power input
- Three colored LEDs (RED, GREEN, YELLOW)
- 10-pin JTAG connector for debug
- Two Grove expansion connectors (UART and I2C) for connectivity for additional sensors
- One PMOD expansion connector (SPI) for connectivity for additional peripherals

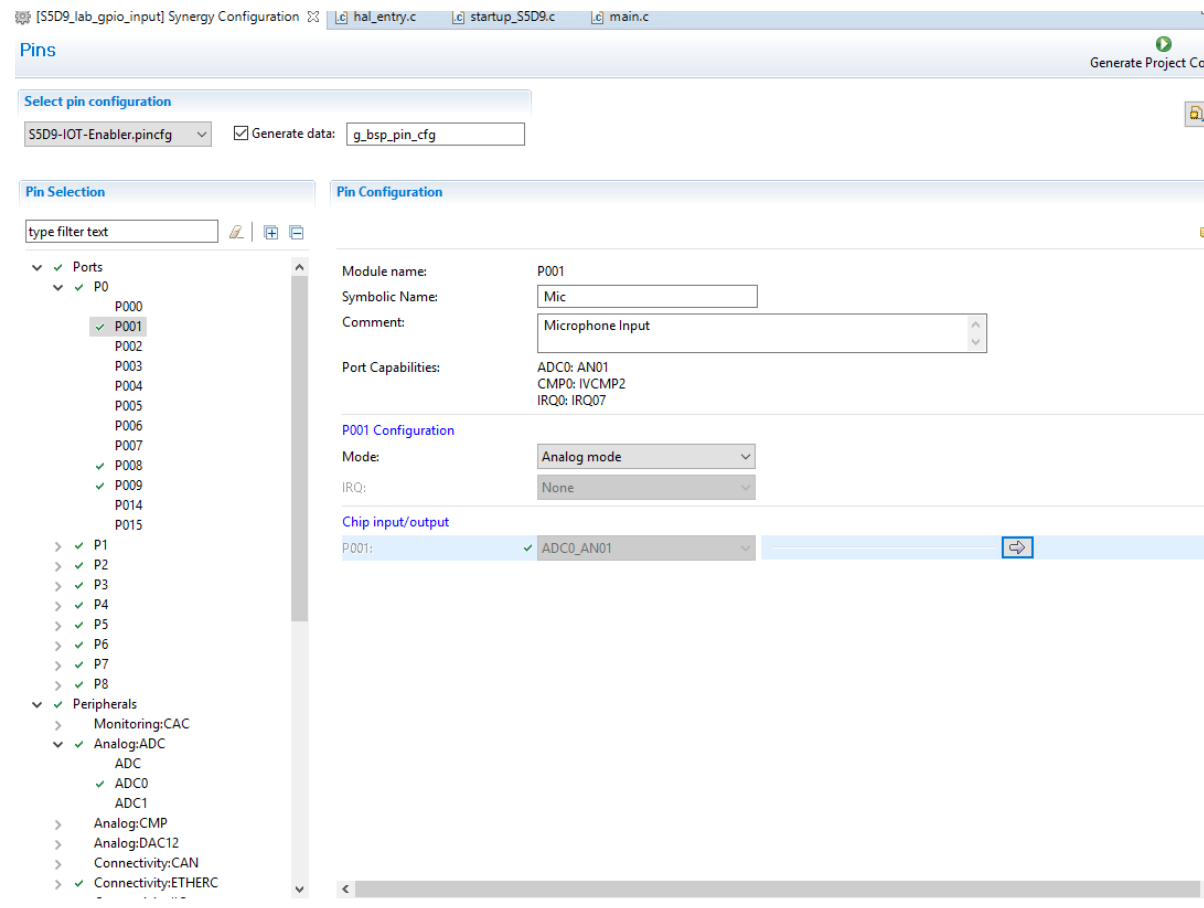


ADC MIC by Michael C. Li

ADC enabled



Pin Configuration



Set up ADC driver

(USBX is also set up to stream ADC data to PC)

The screenshot displays the e2 studio IDE interface for configuring the **g_adc0 ADC Driver on r_adc**. 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 the project structure, with the **SSD9_lab_adc_mic_usb_float** project selected. The central area shows the Synergy Configuration for the **g_adc0 ADC Driver on r_adc**. The **Threads** tab is active, showing the **System Thread** **g_sf_comms0 Communications Framework** and the **g_adc0 ADC Driver on r_adc**. The **System Thread Stacks** tab shows the stack for the **g_adc0 ADC Driver on r_adc**, including the **g_sf_elux_dcd_fs_0 USB Port DCD on sf_elux for USBFS** and the **USBX on ux**. The bottom console area shows the **g_adc0 ADC Driver on r_adc** settings, including the **Mode** set to **Continuous Scan** and the **Channel Scan Mask** set to **Select channels below**.

Property	Value
Common	Enabled
Parameter Checking	Enabled
Module g_adc0 ADC Driver on r_adc	
Name	g_adc0
Unit	0
Resolution	12-Bit
Alignment	Right
Clear after read	On
Mode	Continuous Scan
Channel Scan Mask	Select channels below
Channel 0	Unused
Channel 1	Use in Normal/Group A
Channel 2	Unused
Channel 3	Unused
Channel 4	Unused
Channel 5	Unused
Channel 6	Unused
Channel 7 (S3A7/S124 Only)	Unused
Channel 8 (S3A7/S124 Only)	Unused
Channel 9 (S3A7/S124 Only)	Unused
Channel 10 (S3A7/S124 Only)	Unused

Main Code

```
hal_entry.c  hal_entry.c  system_thread_entry.c  hal_entry.c
19  /*
20
21  #include "system_thread.h"
22
23  #include <stdio.h>
24  #include <string.h>
25
26  // Buffer Size
27  #define UART_BUFFER_SIZE 1024
28
29  // Tick Rate
30  #define COUNTS_PER_MILLISECOND (120E6 / 1000)
31
32  uint8_t string[132];
33
34  /* System Thread entry function */
35  void system_thread_entry(void)
36  {
37      // Variable to hold ADC Data
38      uint16_t adcCounts;
39      uint16_t adcCounts2;
40      float adcVoltage;
41      float adcVoltage2;
42
43      // Open the ADC
44      g_adc.p_api->open (g_adc.p_ctrl, g_adc.p_cfg);
45
46      // Configure Scan
47      g_adc.p_api->scanCfg (g_adc.p_ctrl, g_adc.p_channel_cfg);
48
49      // Start ADC Scan
50      g_adc.p_api->scanStart (g_adc.p_ctrl);
51
52      while (1)
53      {
54          // Read ADC
55          //g_adc.p_api->read (g_adc.p_ctrl, ADC_REG_CHANNEL_0, &adcCounts);
56          g_adc.p_api->read (g_adc.p_ctrl, ADC_REG_CHANNEL_1, &adcCounts2);
57
58          // Convert Counts to Voltage
59          //adcVoltage = ((adcCounts * 3.3f) / 4095.0f); // 12 bits resolution. range: 0 to 3.3V
60          adcVoltage2 = ((adcCounts2 * 3.3f) / 4095.0f);
61
62          sprintf((char *)string, "adcCounts2: %5d  adcVoltage2: %5.2f\r\n", adcCounts2, adcVoltage2);
63          g_sf_comms0.p_api->write(g_sf_comms0.p_ctrl, string, (uint32_t)strlen((char *)string), TX_WAIT_FOREVER);
64
65          tx_thread_sleep (1);
66      }
```

Analog Voltage from MIC as I tap on it.

```
COM11 - PuTTY
adcCounts2: 2495 adcVoltage2: 2.01
adcCounts2: 2435 adcVoltage2: 1.96
adcCounts2: 2598 adcVoltage2: 2.09
adcCounts2: 2382 adcVoltage2: 1.92
D:\adcCounts2: 2382 adcVoltage2: 1.92
adcCounts2: 2382 adcVoltage2: 1.92
adcCounts2: 2383 adcVoltage2: 1.92
adcCounts2: 2382 adcVoltage2: 1.92
adcCounts2: 2381 adcVoltage2: 1.92
adcCounts2: 2384 adcVoltage2: 1.92
adcCounts2: 2384 adcVoltage2: 1.92
adcCounts2: 2382 adcVoltage2: 1.92
adcCounts2: 2382 adcVoltage2: 1.92
adcCounts2: 2383 adcVoltage2: 1.92
adcCounts2: 2384 adcVoltage2: 1.92
adcCounts2: 2383 adcVoltage2: 1.92
adcCounts2: 2419 adcVoltage2: 1.95
adcCounts2: 1751 adcVoltage2: 1.41
adcCounts2: 2039 adcVoltage2: 1.64
adcCounts2: 1969 adcVoltage2: 1.59
adcCounts2: 1969 adcVoltage2: 1.59
adcCounts2: 1968 adcVoltage2: 1.59
adcCounts2: 1984 adcVoltage2: 1.60
adcCounts2: 1985 adcVoltage2: 1.60
adcCounts2: 1963 adcVoltage2: 1.58
adcCounts2: 1933 adcVoltage2: 1.56
adcCounts2: 2305 adcVoltage2: 1.86
adcCounts2: 2065 adcVoltage2: 1.66
adcCounts2: 2063 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2065 adcVoltage2: 1.66
adcCounts2: 2063 adcVoltage2: 1.66
adcCounts2: 2065 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2065 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2065 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2065 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 1908 adcVoltage2: 1.54
adcCounts2: 2224 adcVoltage2: 1.79
adcCounts2: 2086 adcVoltage2: 1.68
adcCounts2: 2081 adcVoltage2: 1.68
adcCounts2: 2053 adcVoltage2: 1.65
adcCounts2: 2063 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
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adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2064 adcVoltage2: 1.66
adcCounts2: 2029 adcVoltage2: 1.64
adcCounts2: 1913 adcVoltage2: 1.54
adcCounts2: 2375 adcVoltage2: 1.92
```