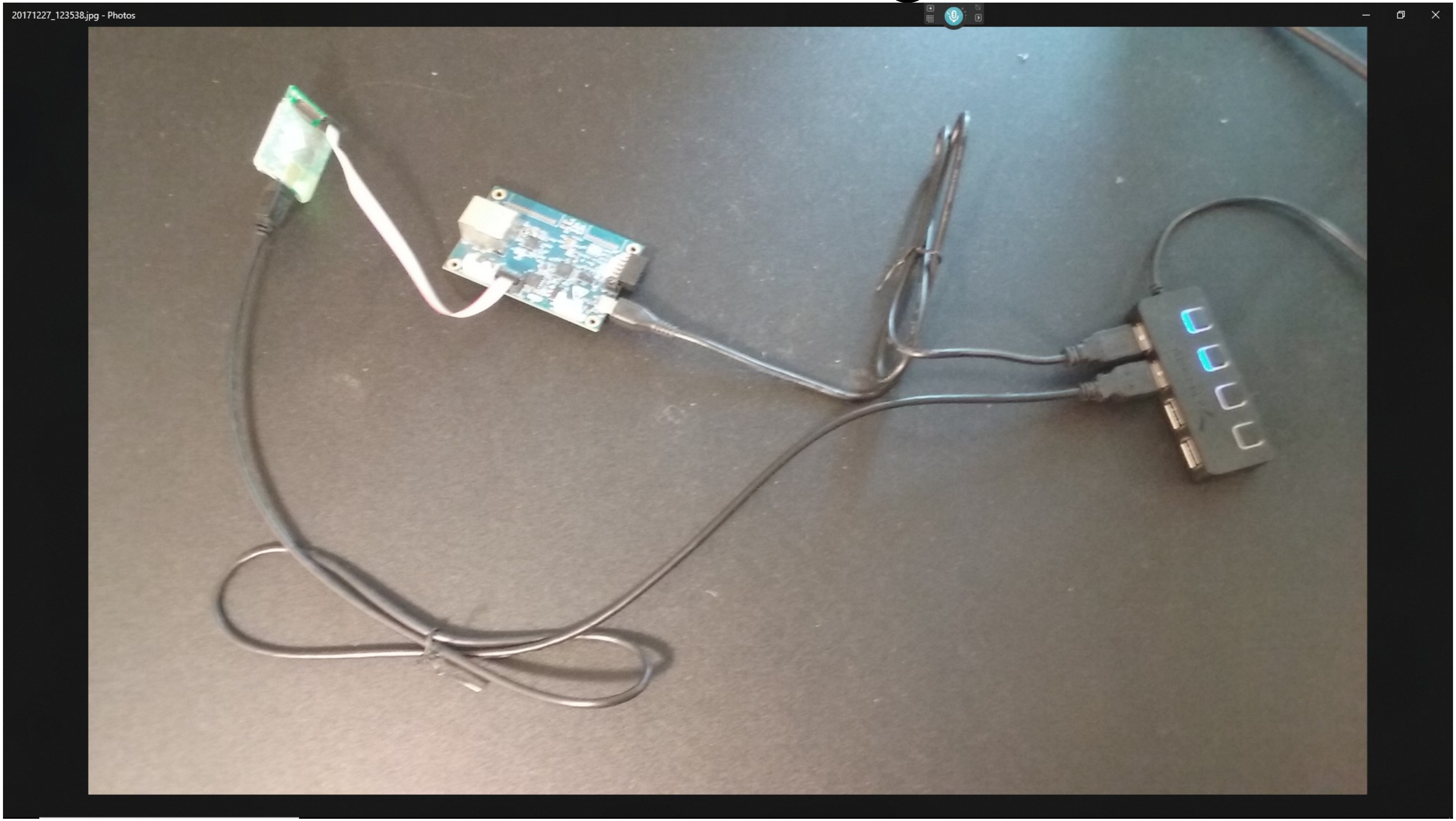
S5D9 Bus USBX sprintf float Example by Michael Li (1/1/2018) https://www.miketechuniverse.com

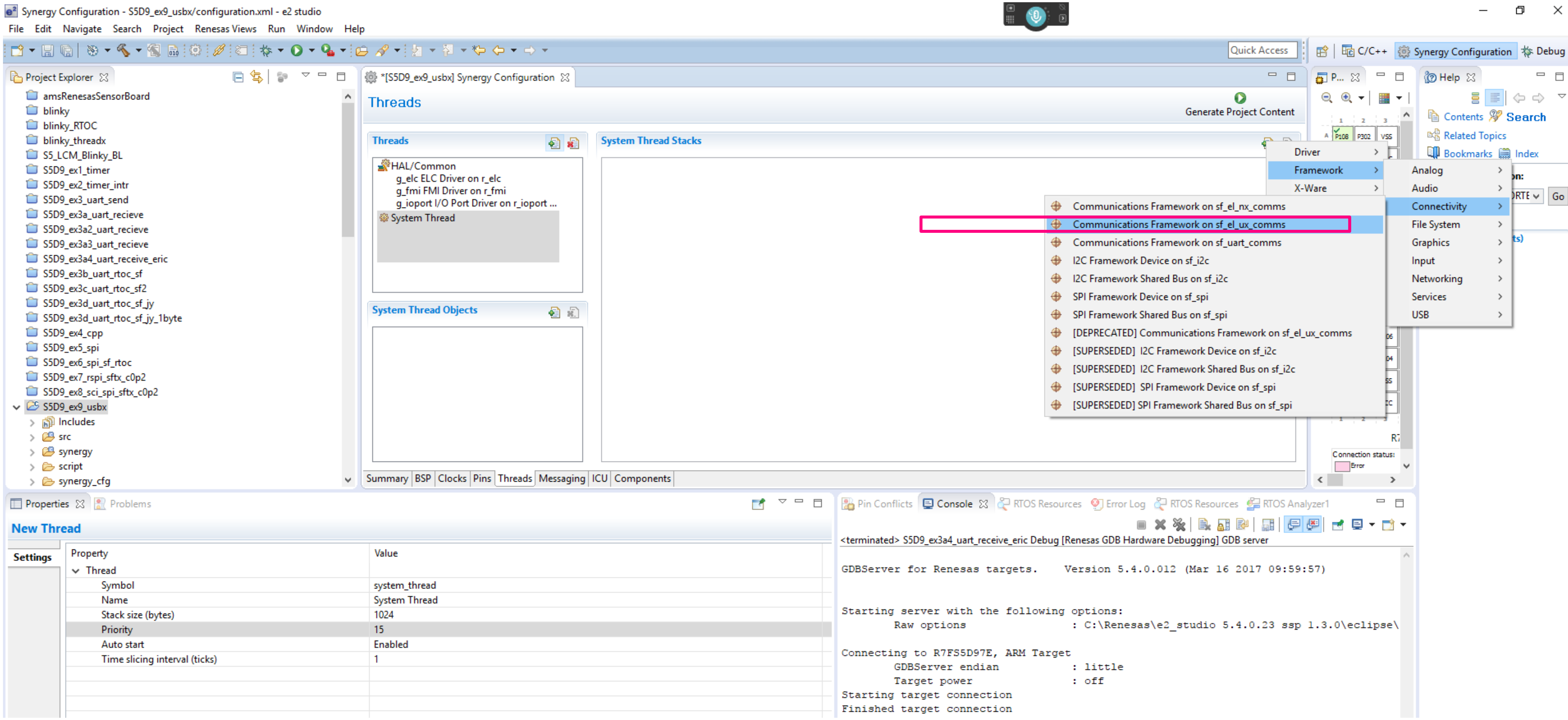
- This example shows how to set up for floating number support in the sprintf function.

E2 Studio 5.4.0.023
SSP 1.3.0

Hardware Setup with S5D9 board and Jlink debug board.



Must create a new thread to use the USBX communication framework.



Synergy Configuration - S5D9_ex9_usbx/configuration.xml - e2 studio
File Edit Navigate Search Project Renesas Views Run Window Help
Quick Access
C/C++
Synergy Configuration
Debug
Project Explorer
amsRenesasSensorBoard
blinky
blinky_RTOC
blinky_threadx
S5_LCM_Blinky_BL
S5D9_ex1_timer
S5D9_ex2_timer_intr
S5D9_ex3_uart_send
S5D9_ex3a_uart_recieve
S5D9_ex3a2_uart_recieve
S5D9_ex3a3_uart_recieve
S5D9_ex3a4_uart_receive_eric
S5D9_ex3b_uart_rtoc_sf
S5D9_ex3c_uart_rtoc_sf2
S5D9_ex3d_uart_rtoc_sf_jy
S5D9_ex3d_uart_rtoc_sf_jy_1byte
S5D9_ex4_cpp
S5D9_ex5_spi
S5D9_ex6_spi_sf_rtoc
S5D9_ex7_rspi_sftx_c0p2
S5D9_ex8_sci_spi_sftx_c0p2
S5D9_ex9_usbx
Includes
src
synergy
script
synergy_cfg
*[S5D9_ex9_usbx] Synergy Configuration
Threads
Generate Project Content
Threads
HAL/Common
g_elc ELC Driver on r_elc
g_fmi FMI Driver on r_fmi
g_ioport I/O Port Driver on r_ioport ...
System Thread
System Thread Stacks
System Thread Objects
Driver
Framework
X-Ware
Analog
Audio
Connectivity
File System
Graphics
Input
Networking
Services
USB
Communications Framework on sf_el_nx_comms
Communications Framework on sf_el_ux_comms
Communications Framework on sf_uart_comms
I2C Framework Device on sf_i2c
I2C Framework Shared Bus on sf_i2c
SPI Framework Device on sf_spi
SPI Framework Shared Bus on sf_spi
[DEPRECATED] Communications Framework on sf_el_ux_comms
[SUPERSEDED] I2C Framework Device on sf_i2c
[SUPERSEDED] I2C Framework Shared Bus on sf_i2c
[SUPERSEDED] SPI Framework Device on sf_spi
[SUPERSEDED] SPI Framework Shared Bus on sf_spi
Summary BSP Clocks Pins Threads Messaging ICU Components
Help
Contents
Search
Related Topics
Bookmarks
Index
Go
Connection status:
Error
Properties
Problems
Pin Conflicts
Console
RTOS Resources
Error Log
RTOS Resources
RTOS Analyzer1

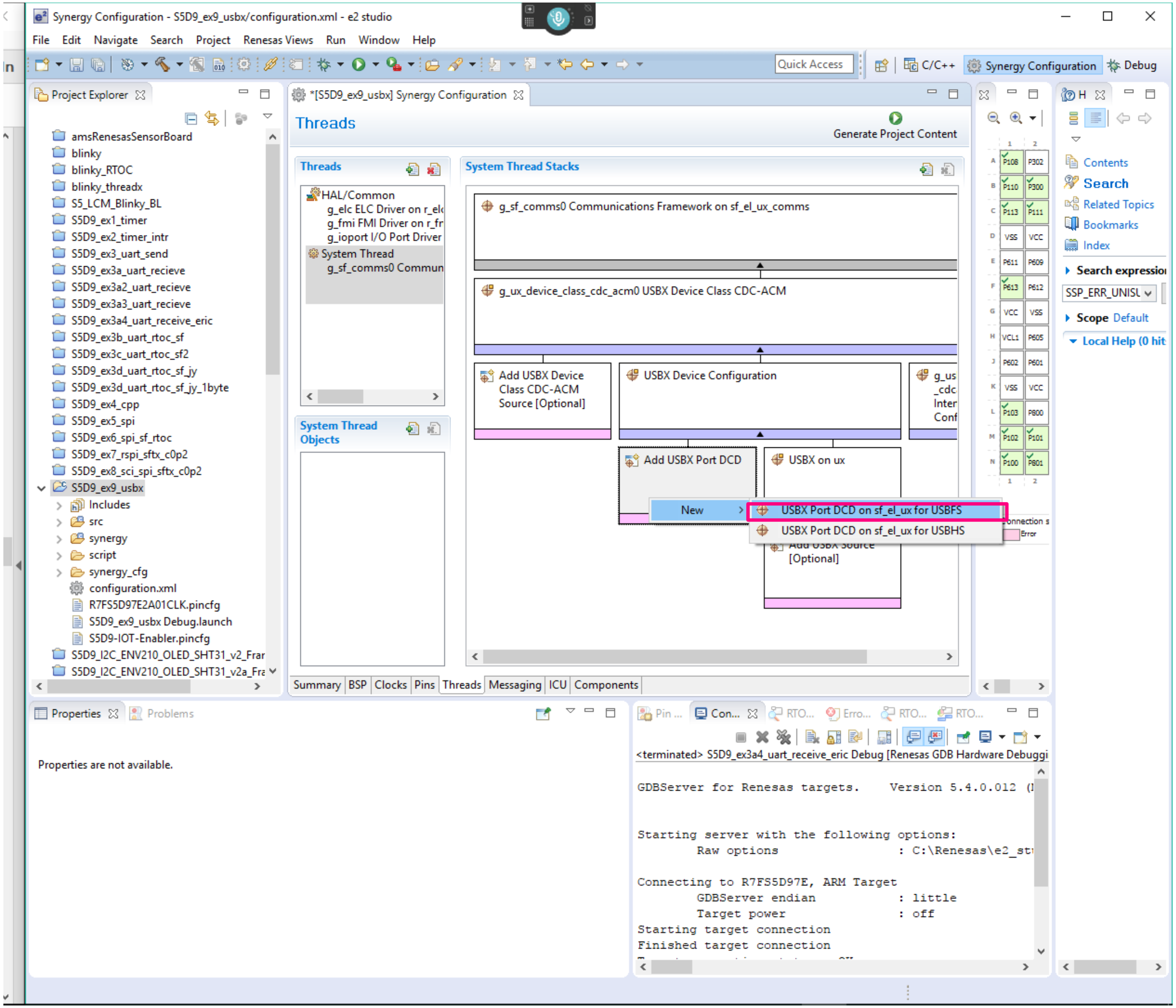
New Thread

Settings

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

```
<terminated> S5D9_ex3a4_uart_receive_eric Debug [Renesas GDB Hardware Debugging] GDB server

GDBServer for Renesas targets.    Version 5.4.0.012 (Mar 16 2017 09:59:57)


Starting server with the following options:
        Raw options                 : C:\Renesas\e2_studio 5.4.0.23 ssp 1.3.0\eclipse\

Connecting to R7FS5D97E, ARM Target
        GDBServer endian            : little
        Target power                : off
Starting target connection
Finished target connection
```

Choose the port

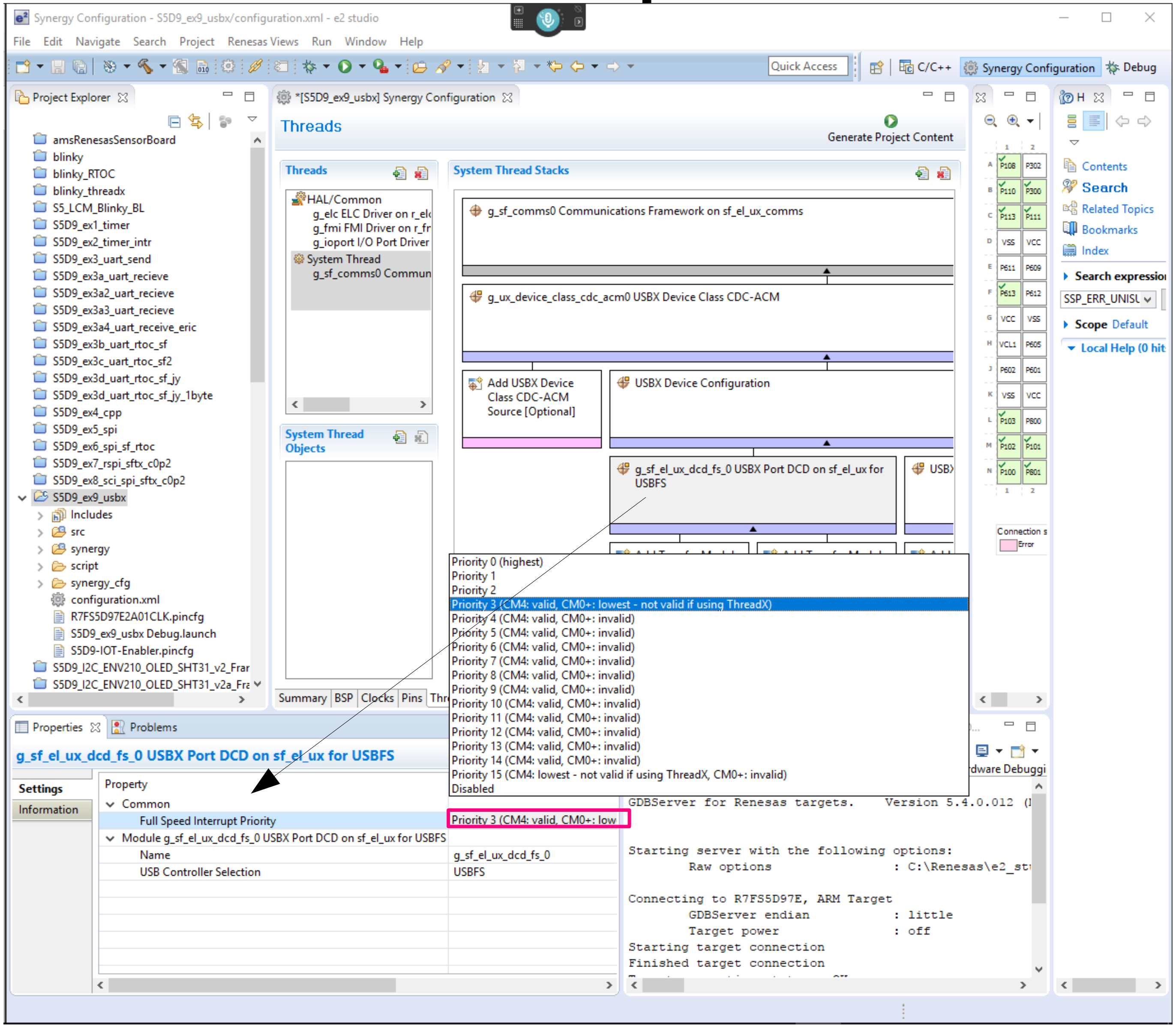


Properties are not available.

<terminated> S5D9_ex3a4_uart_receive_eric Debug [Renesas GDB Hardware Debuggi

```
GDBServer for Renesas targets.    Version 5.4.0.012 (I


Starting server with the following options:
        Raw options                    : C:\Renesas\e2_st

Connecting to R7FS5D97E, ARM Target
        GDBServer endian               : little
        Target power                   : off
Starting target connection
Finished target connection
```

Property: Disable → Priority 3 Interrupt



g_sf_el_ux_dcd_fs_0 USBX Port DCD on sf_el_ux for USBFS

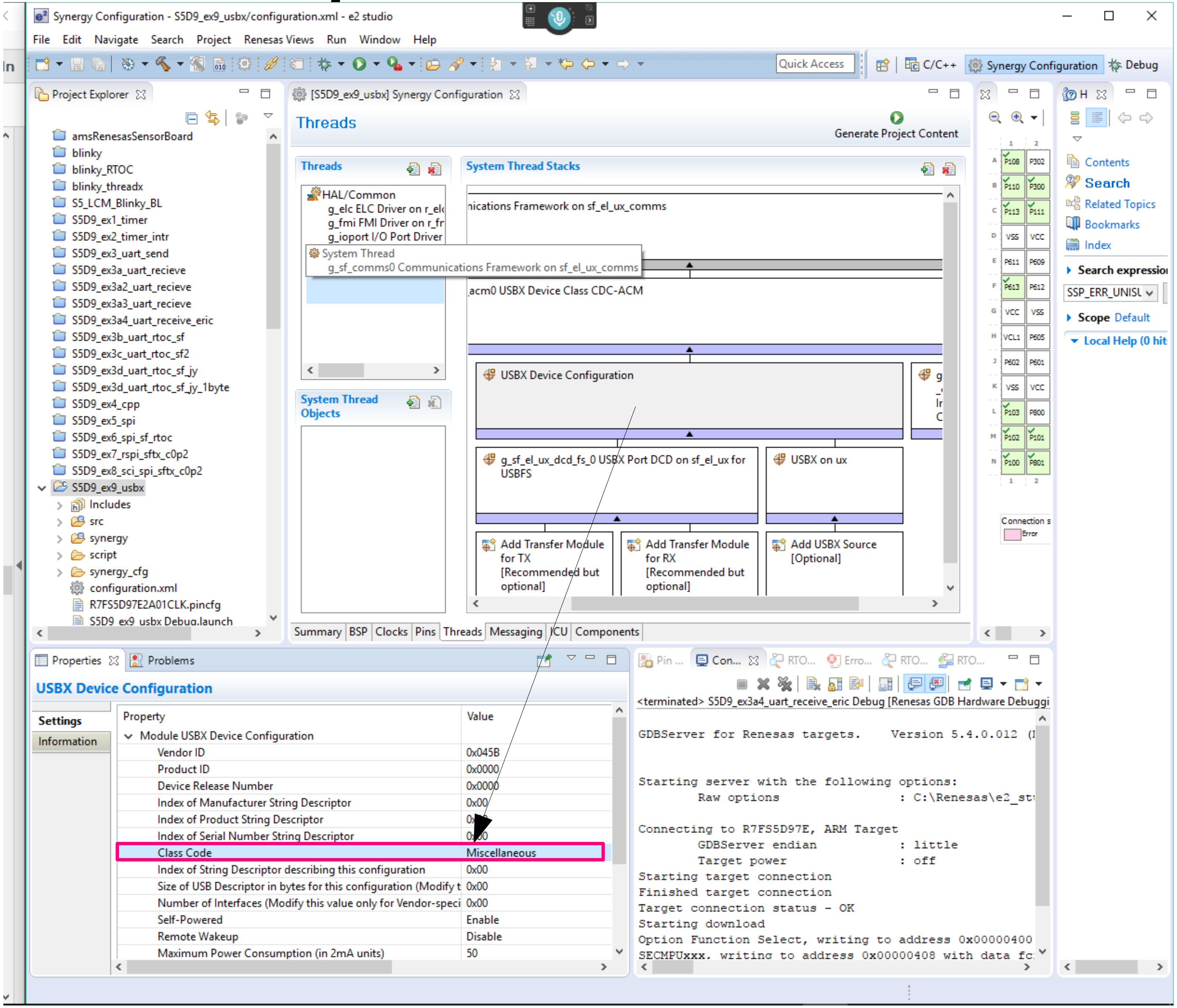
Priority 0 (highest)
Priority 1
Priority 2
Priority 3 (CM4: valid, CM0+: lowest - not valid if using ThreadX)
Priority 4 (CM4: valid, CM0+: invalid)
Priority 5 (CM4: valid, CM0+: invalid)
Priority 6 (CM4: valid, CM0+: invalid)
Priority 7 (CM4: valid, CM0+: invalid)
Priority 8 (CM4: valid, CM0+: invalid)
Priority 9 (CM4: valid, CM0+: invalid)
Priority 10 (CM4: valid, CM0+: invalid)
Priority 11 (CM4: valid, CM0+: invalid)
Priority 12 (CM4: valid, CM0+: invalid)
Priority 13 (CM4: valid, CM0+: invalid)
Priority 14 (CM4: valid, CM0+: invalid)
Priority 15 (CM4: lowest - not valid if using ThreadX, CM0+: invalid)
Disabled

Settings
Information

Property	
Common	
Full Speed Interrupt Priority	Priority 3 (CM4: valid, CM0+: low
Module g_sf_el_ux_dcd_fs_0 USBX Port DCD on sf_el_ux for USBFS	
Name	g_sf_el_ux_dcd_fs_0
USB Controller Selection	USBFS

```
GDBServer for Renesas targets.    Version 5.4.0.012 (I

Starting server with the following options:
        Raw options              : C:\Renesas\e2_stu

Connecting to R7FS5D97E, ARM Target
        GDBServer endian         : little
        Target power             : off
Starting target connection
Finished target connection
```

Update the Class Code for uploading Window OS driver.



Synergy Configuration - S5D9_ex9_usbx/configuration.xml - e2 studio

- amsRenesasSensorBoard
- blinky
- blinky_RTOC
- blinky_threadx
- S5_LCM_Blinky_BL
- S5D9_ex1_timer
- S5D9_ex2_timer_intr
- S5D9_ex3_uart_send
- S5D9_ex3a_uart_recieve
- S5D9_ex3a2_uart_recieve
- S5D9_ex3a3_uart_recieve
- S5D9_ex3a4_uart_receive_eric
- S5D9_ex3b_uart_rtoc_sf
- S5D9_ex3c_uart_rtoc_sf2
- S5D9_ex3d_uart_rtoc_sf_jy
- S5D9_ex3d_uart_rtoc_sf_jy_1byte
- S5D9_ex4_cpp
- S5D9_ex5_spi
- S5D9_ex6_spi_sf_rtoc
- S5D9_ex7_rspi_sftx_c0p2
- S5D9_ex8_sci_spi_sftx_c0p2
- S5D9_ex9_usbx
  - Includes
  - src
  - synergy
  - script
  - synergy_cfg
  - configuration.xml
  - R7FS5D97E2A01CLK.pincfg
  - S5D9_ex9_usbx Debug.launch

HAL/Common
g_elc ELC Driver on r_elc
g_fmi FMI Driver on r_fr
g_ioport I/O Port Driver
System Thread
g_sf_comms0 Communications Framework on sf_el_ux_comms

nications Framework on sf_el_ux_comms

acm0 USBX Device Class CDC-ACM

USBX Device Configuration

g_sf_el_ux_dcd_fs_0 USBX Port DCD on sf_el_ux for USBFS

USBX on ux

Add Transfer Module for TX [Recommended but optional]

Add Transfer Module for RX [Recommended but optional]

Add USBX Source [Optional]

USBX Device Configuration

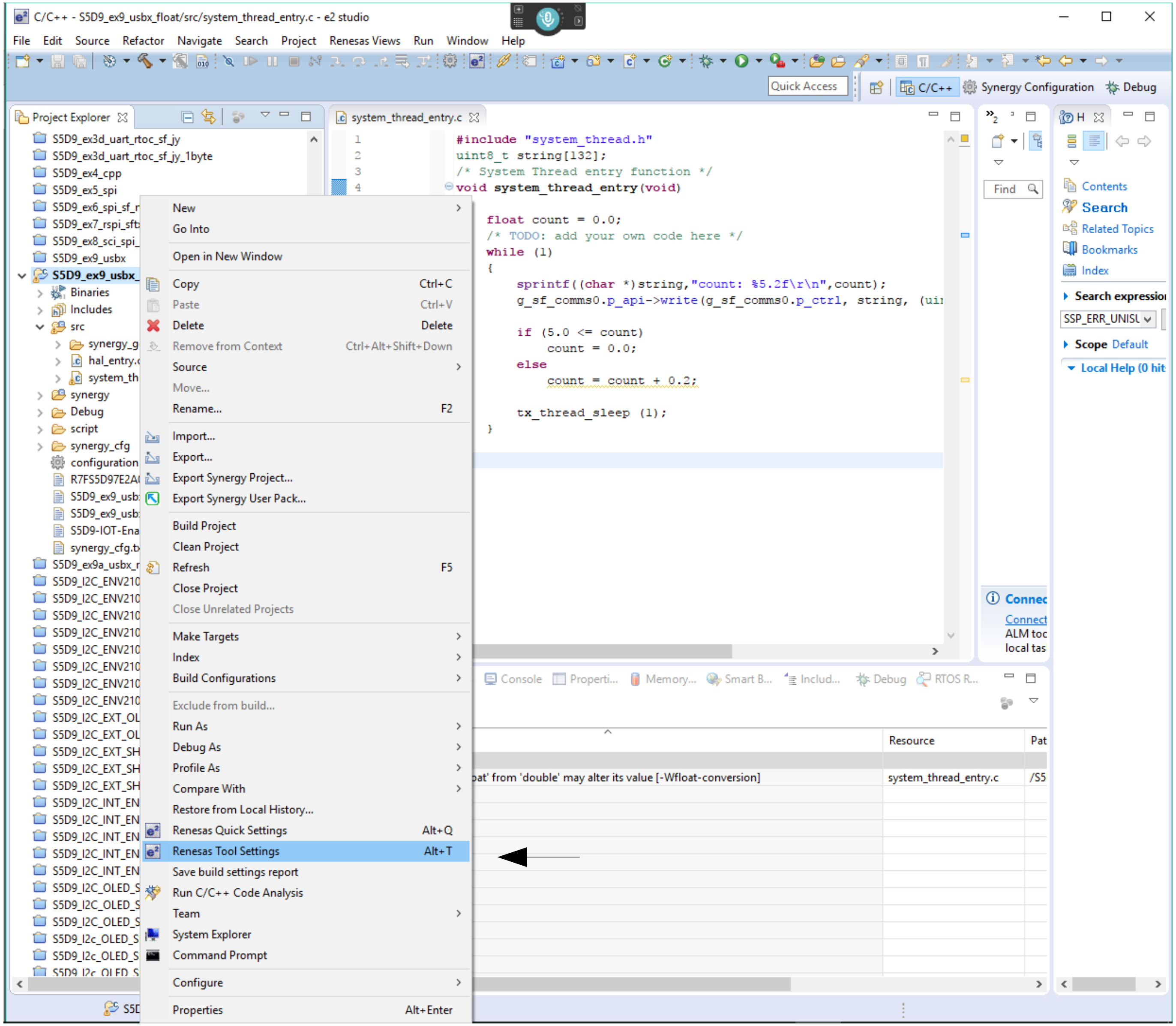
Settings
Information

Property	Value
Module USBX Device Configuration	
Vendor ID	0x045B
Product ID	0x0000
Device Release Number	0x0000
Index of Manufacturer String Descriptor	0x00
Index of Product String Descriptor	0x00
Index of Serial Number String Descriptor	0x00
Class Code	Miscellaneous
Index of String Descriptor describing this configuration	0x00
Size of USB Descriptor in bytes for this configuration (Modify t	0x00
Number of Interfaces (Modify this value only for Vendor-speci	0x00
Self-Powered	Enable
Remote Wakeup	Disable
Maximum Power Consumption (in 2mA units)	50

<terminated> S5D9_ex3a4_uart_receive_eric Debug [Renesas GDB Hardware Debuggi

```
GDBServer for Renesas targets.    Version 5.4.0.012 (I


Starting server with the following options:
        Raw options                     : C:\Renesas\e2_st

Connecting to R7FS5D97E, ARM Target
        GDBServer endian                : little
        Target power                    : off
Starting target connection
Finished target connection
Target connection status - OK
Starting download
Option Function Select, writing to address 0x00000400
SECMPUxxx, writing to address 0x00000408 with data fc:
```

Choose Renesas Tool Settings



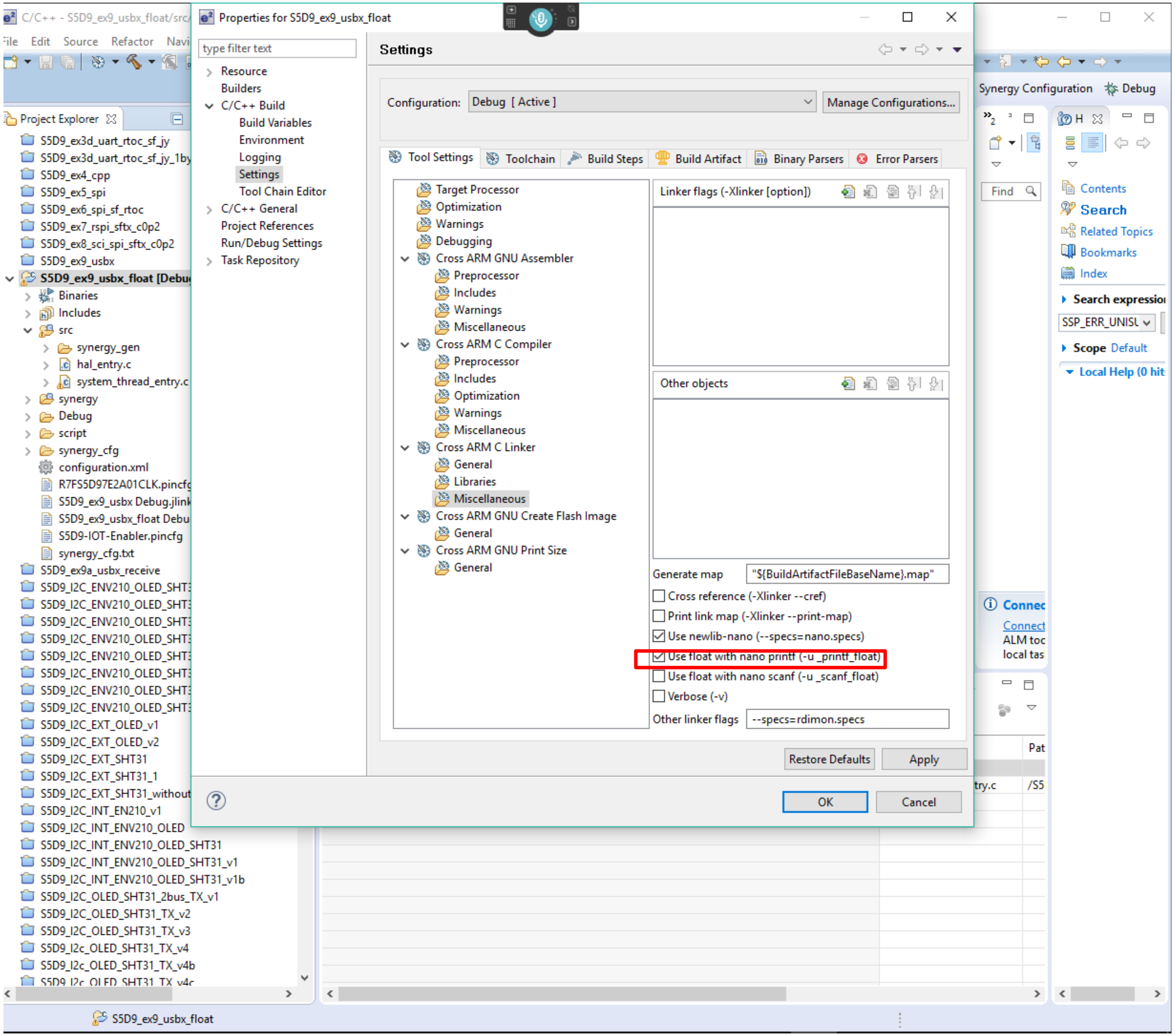
Project Explorer:

- S5D9_ex3d_uart_rtoc_sf_jy
- S5D9_ex3d_uart_rtoc_sf_jy_1byte
- S5D9_ex4_cpp
- S5D9_ex5_spi
- S5D9_ex6_spi_sf_r
- S5D9_ex7_rspi_sft
- S5D9_ex8_sci_spi_
- S5D9_ex9_usbx
- S5D9_ex9_usbx_
  - Binaries
  - Includes
  - src
    - synergy_g
    - hal_entry.
    - system_th
  - synergy
  - Debug
  - script
  - synergy_cfg
  - configuration
  - R7FS5D97E2A
  - S5D9_ex9_usb
  - S5D9_ex9_usb
  - S5D9-IOT-Ena
  - synergy_cfg.t
- S5D9_ex9a_usbx_r
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_ENV210
- S5D9_I2C_EXT_OL
- S5D9_I2C_EXT_OL
- S5D9_I2C_EXT_SH
- S5D9_I2C_EXT_SH
- S5D9_I2C_EXT_SH
- S5D9_I2C_INT_EN
- S5D9_I2C_INT_EN
- S5D9_I2C_INT_EN
- S5D9_I2C_INT_EN
- S5D9_I2C_INT_EN
- S5D9_I2C_OLED_S
- S5D9_I2C_OLED_S
- S5D9_I2C_OLED_S
- S5D9_I2c_OLED_S
- S5D9_I2c_OLED_S
- S5D9_I2c_OLED_S

```
#include "system_thread.h"
uint8_t string[132];
/* System Thread entry function */
void system_thread_entry(void)

    float count = 0.0;
    /* TODO: add your own code here */
    while (1)
    {
        sprintf((char *)string,"count: %5.2f\r\n",count);
        g_sf_comms0.p_api->write(g_sf_comms0.p_ctrl, string, (ui

        if (5.0 <= count)
            count = 0.0;
        else
            count = count + 0.2;

        tx_thread_sleep (1);
    }
```

	Resource	Pat
at' from 'double' may alter its value [-Wfloat-conversion]	system_thread_entry.c	/S5

Check the box for float printf support



Configuration: Debug [Active]

Linker flags (-Xlinker [option])

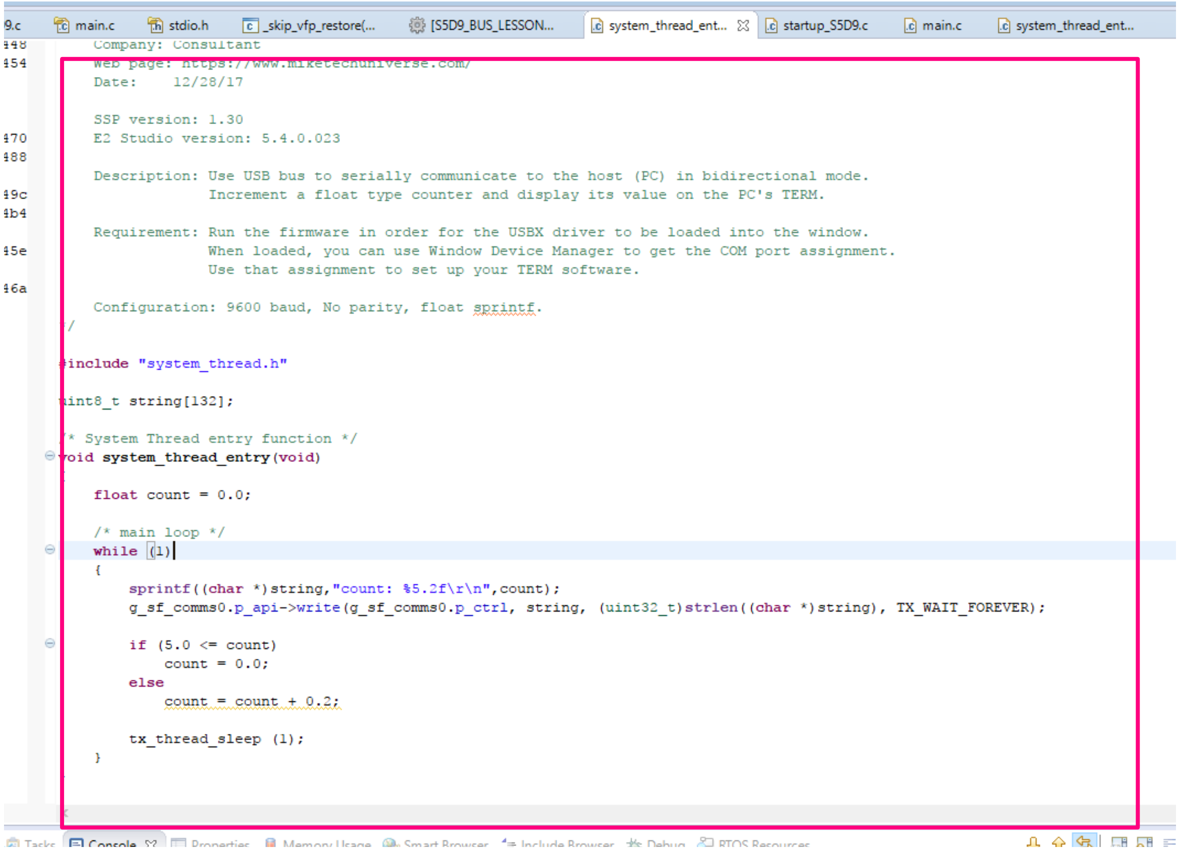
Other objects

Generate map "${BuildArtifactFileBaseName}.map"

☐ Cross reference (-Xlinker --cref)
☐ Print link map (-Xlinker --print-map)
☑ Use newlib-nano (--specs=nano.specs)
☑ Use float with nano printf (-u _printf_float)
☐ Use float with nano scanf (-u _scanf_float)
☐ Verbose (-v)

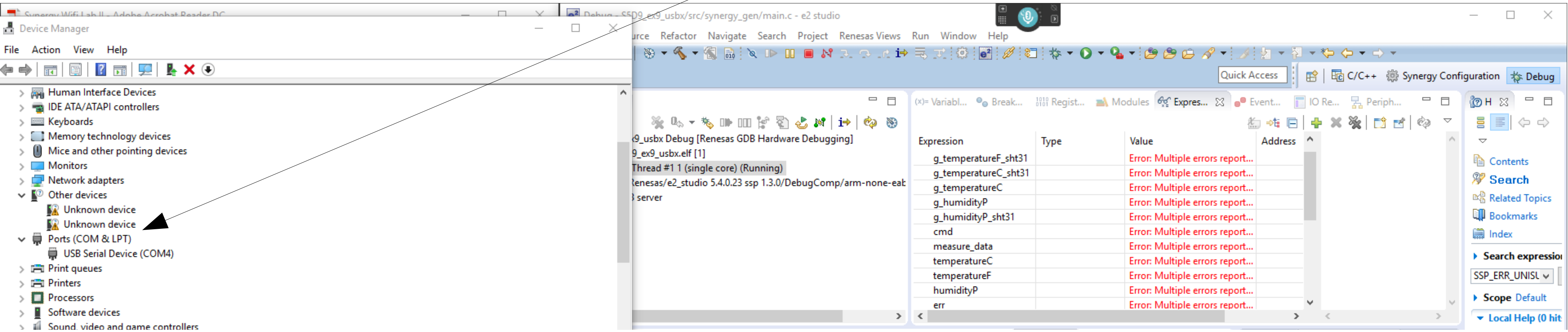
Other linker flags --specs=rdimon.specs

System Thread’s forever loop.



```
    Company: Consultant
    Web page: https://www.miketechuniverse.com/
    Date:     12/28/17

    SSP version: 1.30
    E2 Studio version: 5.4.0.023

    Description: Use USB bus to serially communicate to the host (PC) in bidirectional mode.
                 Increment a float type counter and display its value on the PC's TERM.

    Requirement: Run the firmware in order for the USBX driver to be loaded into the window.
                 When loaded, you can use Window Device Manager to get the COM port assignment.
                 Use that assignment to set up your TERM software.

    Configuration: 9600 baud, No parity, float sprintf.
*/

#include "system_thread.h"

uint8_t string[132];

/* System Thread entry function */
void system_thread_entry(void)
{
    float count = 0.0;

    /* main loop */
    while (1)
    {
        sprintf((char *)string,"count: %5.2f\r\n",count);
        g_sf_comms0.p_api->write(g_sf_comms0.p_ctrl, string, (uint32_t)strlen((char *)string), TX_WAIT_FOREVER);

        if (5.0 <= count)
            count = 0.0;
        else
            count = count + 0.2;

        tx_thread_sleep (1);
    }
}
```

Run the firmware before you can see COM4



Device Manager

File Action View Help

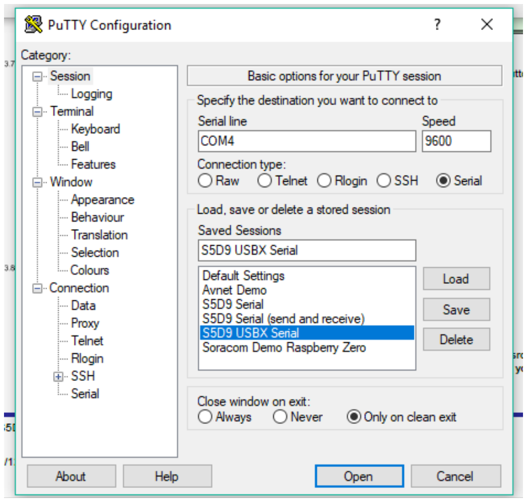
- Human Interface Devices
- IDE ATA/ATAPI controllers
- Keyboards
- Memory technology devices
- Mice and other pointing devices
- Monitors
- Network adapters
- Other devices
  - Unknown device
  - Unknown device
- Ports (COM & LPT)
  - USB Serial Device (COM4)
- Print queues
- Printers
- Processors
- Software devices
- Sound, video and game controllers

Debug - S5D9_ex9_usbx/src/synergy_gen/main.c - e2 studio

```
9_usbx Debug [Renesas GDB Hardware Debugging]
9_ex9_usbx.elf [1]
Thread #1 1 (single core) (Running)
Renesas/e2_studio 5.4.0.23 ssp 1.3.0/DebugComp/arm-none-eab
 server
```

Expression	Type	Value	Address
g_temperatureF_sht31		Error: Multiple errors report...	
g_temperatureC_sht31		Error: Multiple errors report...	
g_temperatureC		Error: Multiple errors report...	
g_humidityP		Error: Multiple errors report...	
g_humidityP_sht31		Error: Multiple errors report...	
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		Error: Multiple errors report...	

Serial port Setting



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Serial line: COM4 Speed: 9600

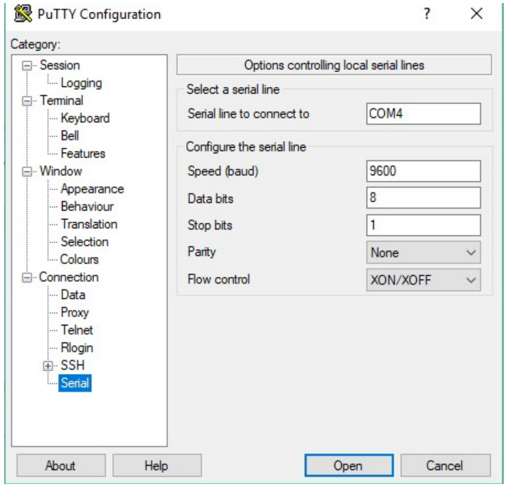
Connection type: ○ Raw ○ Telnet ○ Rlogin ○ SSH ● Serial

Load, save or delete a stored session

Saved Sessions: S5D9 USBX Serial

- Default Settings
- Avnet Demo
- S5D9 Serial
- S5D9 Serial (send and receive)
- S5D9 USBX Serial
- Soracom Demo Raspberry Zero

Close window on exit: ○ Always ○ Never ● Only on clean exit



PuTTY Configuration

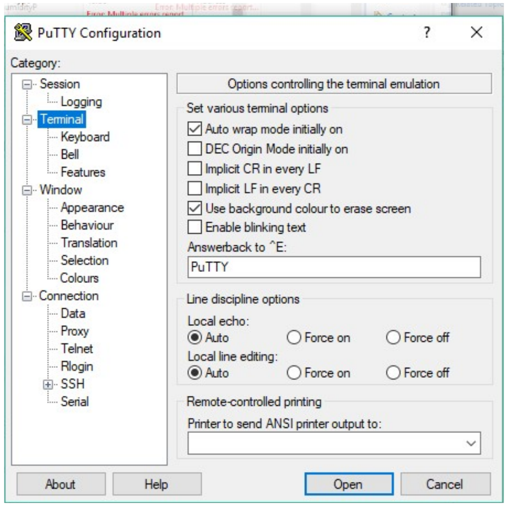
Options controlling local serial lines

Select a serial line

Serial line to connect to: COM4

Configure the serial line

Speed (baud)	9600
Data bits	8
Stop bits	1
Parity	None
Flow control	XON/XOFF



PuTTY Configuration

Options controlling the terminal emulation

Set various terminal options

- ☑ Auto wrap mode initially on
- □ DEC Origin Mode initially on
- □ Implicit CR in every LF
- □ Implicit LF in every CR
- ☑ Use background colour to erase screen
- □ Enable blinking text

Answerback to ^E: PuTTY

Line discipline options

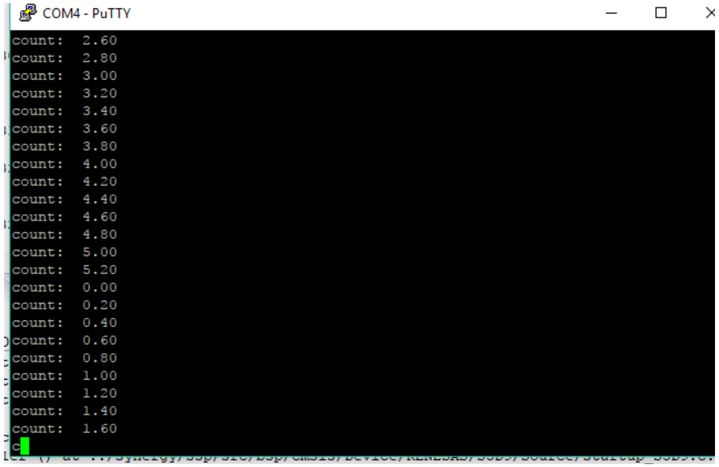
Local echo: ● Auto ○ Force on ○ Force off

Local line editing: ● Auto ○ Force on ○ Force off

Remote-controlled printing

Printer to send ANSI printer output to:

Run Serial Term Putty



```
count:  2.60
count:  2.80
count:  3.00
count:  3.20
count:  3.40
count:  3.60
count:  3.80
count:  4.00
count:  4.20
count:  4.40
count:  4.60
count:  4.80
count:  5.00
count:  5.20
count:  0.00
count:  0.20
count:  0.40
count:  0.60
count:  0.80
count:  1.00
count:  1.20
count:  1.40
count:  1.60
c
```