

S5D9 Lab Watch Dog Timer WDT

By

Michael Li

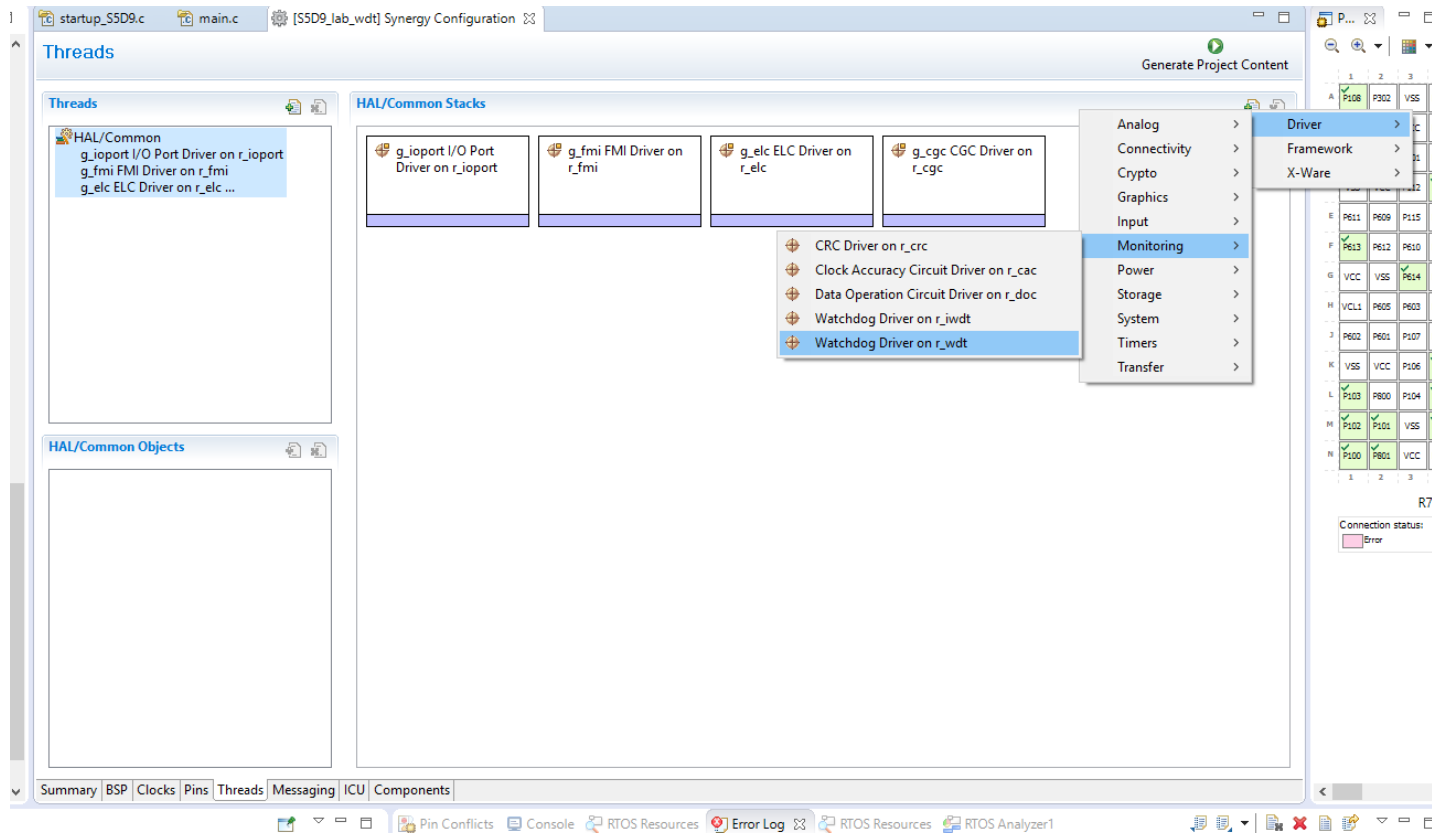
(2/5/2018)

<https://www.miketechuniverse.com>

E2 Studio 5.4.0.023

SSP 1.3.0

WDT Driver



Properties

Synergy Configuration - SSD9_lab_wdt/configuration.xml - e2 studio

File Edit Navigate Search Project Renesas Views Run Window Help

Project Explorer

- 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_lab_adc_mic_usbx_float
- SSD9_lab_gpio_input
- SSD9_lab_led_loop
- SSD9_lab_led_timer
- SSD9_lab_led_timer_intr
- SSD9_lab_pwm
- SSD9_lab_qpi_flash
- SSD9_lab_wdt
 - Includes
 - src
 - synergy

Threads

HAL/Common

- g_ioport I/O Port Driver on r_ioport
- g_fmi FMI Driver on r_fmi
- g_elc ELC Driver on r_elc ...

HAL/Common Stacks

- g_ioport I/O Port Driver on r_ioport
- g_fmi FMI Driver on r_fmi
- g_elc ELC Driver on r_elc
- g_cgc CGC Driver on r_cgc
- g_wdt Watchdog Driver on r_wdt

HAL/Common Objects

Summary BSP Clocks Pins Threads Messaging ICU Components

Properties Problems

g_wdt0 Watchdog Driver on r_wdt

Settings

Information

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_wdt0 Watchdog Driver on r_wdt	
Name	g_wdt
Start Mode	Register
Start Watchdog After Configuration	False
Timeout	16,384 Cycles
Clock Division Ratio	PCLK/8192
Window Start Position	100% (Window Position Not Specified)
Window End Position	0% (Window Position Not Specified)
Reset Control	Reset Output
Stop Control	WDT Count Disabled in Low Power Mode
NMI Callback	NULL

Workspace Log

Message	Plug-in	Date
Input file not found: "...". Using first of 1 alternatives: ...	com.tasking.util	1/15/18, 7:41 PM
Indexed 'SSD9_lab_wdt' (30 sources, 89 headers) in ...	org.eclipse.cdt.core	1/15/18, 7:40 PM
Input file not found: "...". Using first of 1 alternatives: ...	com.tasking.util	1/15/18, 7:40 PM
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Error logged from Debug UI:	org.eclipse.debug.ui	1/15/18, 7:34 PM
Problems occurred when invoking code from plug-in:	org.eclipse.debug.ui	1/15/18, 7:34 PM
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Removing model for session 10	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:34 PM
Saving model state for session 10	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:34 PM
Loading lo Map: C:\Renesas\e2_studio540_ssp130...	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:32 PM
Creating new Model for gdb[10].proc[1].threadGrou...	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:32 PM
Removing model for session 9	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:32 PM
Saving model state for session 9	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:32 PM
Loading lo Map: C:\Renesas\e2_studio540_ssp130...	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:30 PM
Creating new Model for gdb[9].proc[1].threadGrou...	com.renesas.cdt.debug.ioview.dsf	1/15/18, 7:30 PM

Add a 32 bit timer to refresh WDT

Configuration - SSD9_lab_wdt/configuration.xml - e2 studio

File Edit View Project Renesas Views Run Window Help

Project Explorer

- !C_OLED_SHT31_TX_v2
- !C_OLED_SHT31_TX_v3
- !C_OLED_SHT31_TX_v4
- !C_OLED_SHT31_TX_v4b
- !C_OLED_SHT31_TX_v4c
- !C_OLED_TX_v1
- !C_Sensor_Lab
- !C_Sensor_Lab_Framework
- !C_SHT31_OLED_TX_UARTBUS_v1
- !C_SHT31_OLED_TX_UARTBUS_v2
- !C_SHT31_OLED_TX_UARTBUS_v3
- !C_SHT31_OLED_TX_UARTBUS_v3a
- !C_SHT31_OLED_TX_UARTBUS_v3b
- !C_SHT31_OLED_TX_UARTBUS_v3c
- !C_SHT31_OLED_TX_UARTBUS_v4
- !C_SHT31_TO_BMC_TX_UARTBUS_v1
- !C_SHT31_TX_UARTBUS_v1
- !C_without_Tx
- !b_adc_mic_usbx_float
- !b_gpio_input
- !b_led_loop
- !b_led_timer
- !b_led_timer_intr
- !b_pwm
- !b_qpi_flash
- !b_wdt

Threads

HAL/Common

- g_ioport I/O Port Driver on r_ioport
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- g_elc ELC Driver on r_elc ...

HAL/Common Objects

Summary BSP Clocks Pins Threads Messaging ICU Components

Timer Driver on r_gpt

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_timer0 Timer Driver on r_gpt	
Name	g_timer
Channel	0
Mode	Periodic
Period Value	1000
Period Unit	Milliseconds
Duty Cycle Value	50
Duty Cycle Unit	Unit Raw Counts
Auto Start	True
GPIOA Output Enabled	False
GPIOA Stop Level	Pin Level Low
GPIOB Output Enabled	False
GPIOB Stop Level	Pin Level Low
Callback	NULL
Interrupt Priority	Disabled

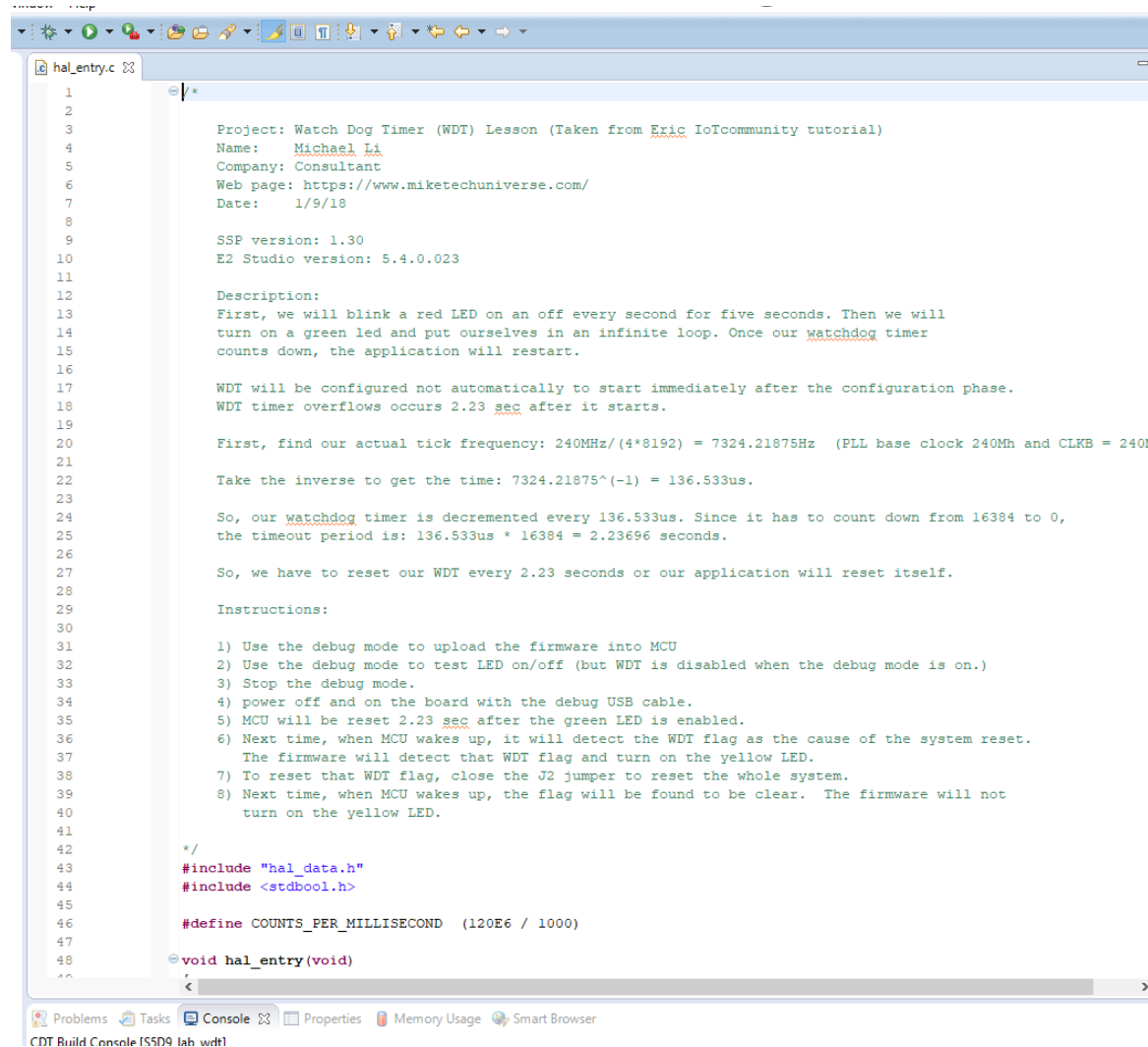
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Input file not found: "...". Using first of 1 alternatives: ...	com.tasking.util	1/15/18, 7:46 PM
Input file not found: "...". Using first of 1 alternatives: ...	com.tasking.util	1/15/18, 7:46 PM
Input file not found: "...". Using first of 1 alternatives: ...	com.tasking.util	1/15/18, 7:44 PM
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Removing model for session 8	com.renesas.cdt.debug.ioview.ds	1/15/18, 7:30 PM

Main Code Description

For testing, load the firmware into the ROM. Then stop e2 studio debug mode. Turn power off/on.

WDT will not be enabled if you use the e2studio debug mode.



```
1
2
3
4 Project: Watch Dog Timer (WDT) Lesson (Taken from Eric IoTcommunity tutorial)
5 Name: Michael Li
6 Company: Consultant
7 Web page: https://www.miketechuniverse.com/
8 Date: 1/9/18
9
10 SSP version: 1.30
11 E2 Studio version: 5.4.0.023
12
13 Description:
14 First, we will blink a red LED on an off every second for five seconds. Then we will
15 turn on a green led and put ourselves in an infinite loop. Once our watchdog timer
16 counts down, the application will restart.
17
18 WDT will be configured not automatically to start immediately after the configuration phase.
19 WDT timer overflows occurs 2.23 sec after it starts.
20
21 First, find our actual tick frequency: 240MHz/(4*8192) = 7324.21875Hz (PLL base clock 240Mh and CLKB = 240M
22
23 Take the inverse to get the time: 7324.21875^(-1) = 136.533us.
24
25 So, our watchdog timer is decremented every 136.533us. Since it has to count down from 16384 to 0,
26 the timeout period is: 136.533us * 16384 = 2.23696 seconds.
27
28 So, we have to reset our WDT every 2.23 seconds or our application will reset itself.
29
30 Instructions:
31 1) Use the debug mode to upload the firmware into MCU
32 2) Use the debug mode to test LED on/off (but WDT is disabled when the debug mode is on.)
33 3) Stop the debug mode.
34 4) power off and on the board with the debug USB cable.
35 5) MCU will be reset 2.23 sec after the green LED is enabled.
36 6) Next time, when MCU wakes up, it will detect the WDT flag as the cause of the system reset.
37 The firmware will detect that WDT flag and turn on the yellow LED.
38 7) To reset that WDT flag, close the J2 jumper to reset the whole system.
39 8) Next time, when MCU wakes up, the flag will be found to be clear. The firmware will not
40 turn on the yellow LED.
41
42 */
43 #include "hal_data.h"
44 #include <stdbool.h>
45
46 #define COUNTS_PER_MILLISECOND (120E6 / 1000)
47
48 void hal_entry(void)
```