

# S5D9 Lab GPIO input off board

By

Michael Li

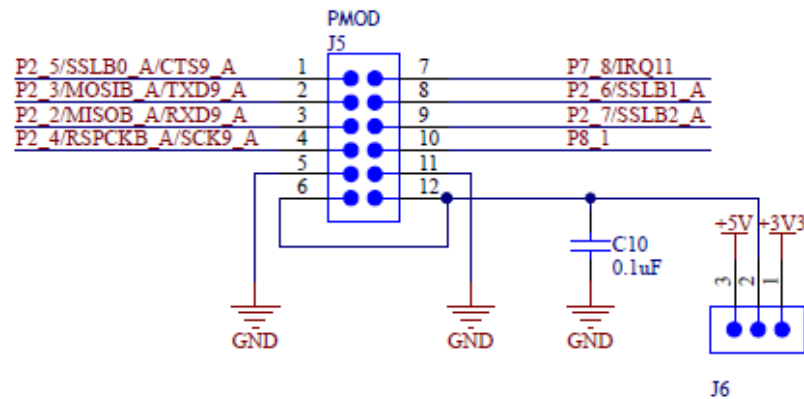
(2/5/2018)

<https://www.miketechuniverse.com>

E2 Studio 5.4.0.023

SSP 1.3.0

# Schematic

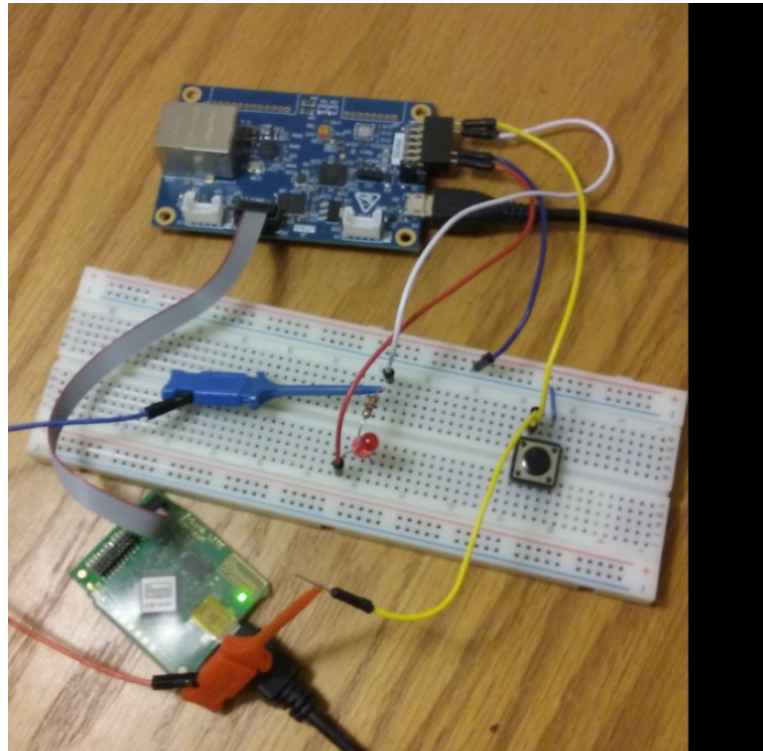


P2\_5 = External Button

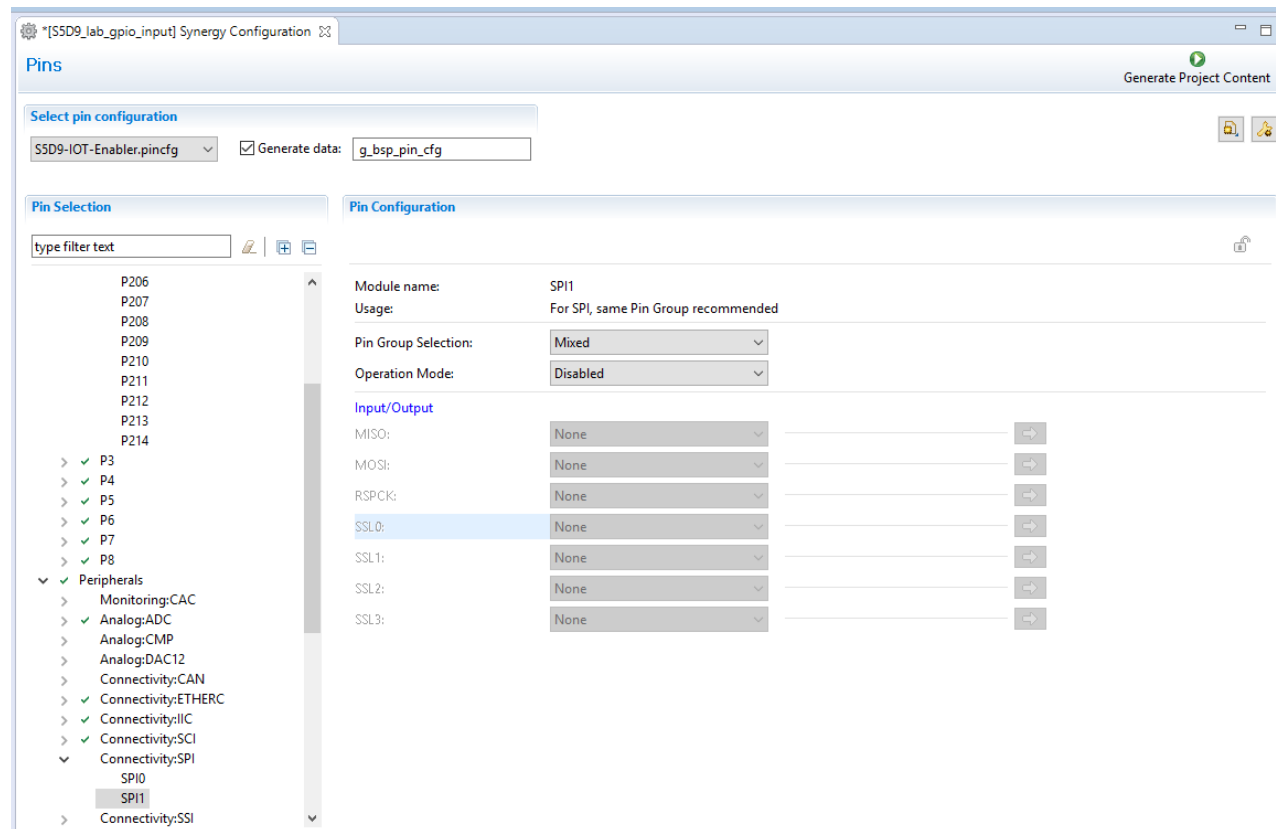
P2\_3 = External LED

VCC = 3.3V

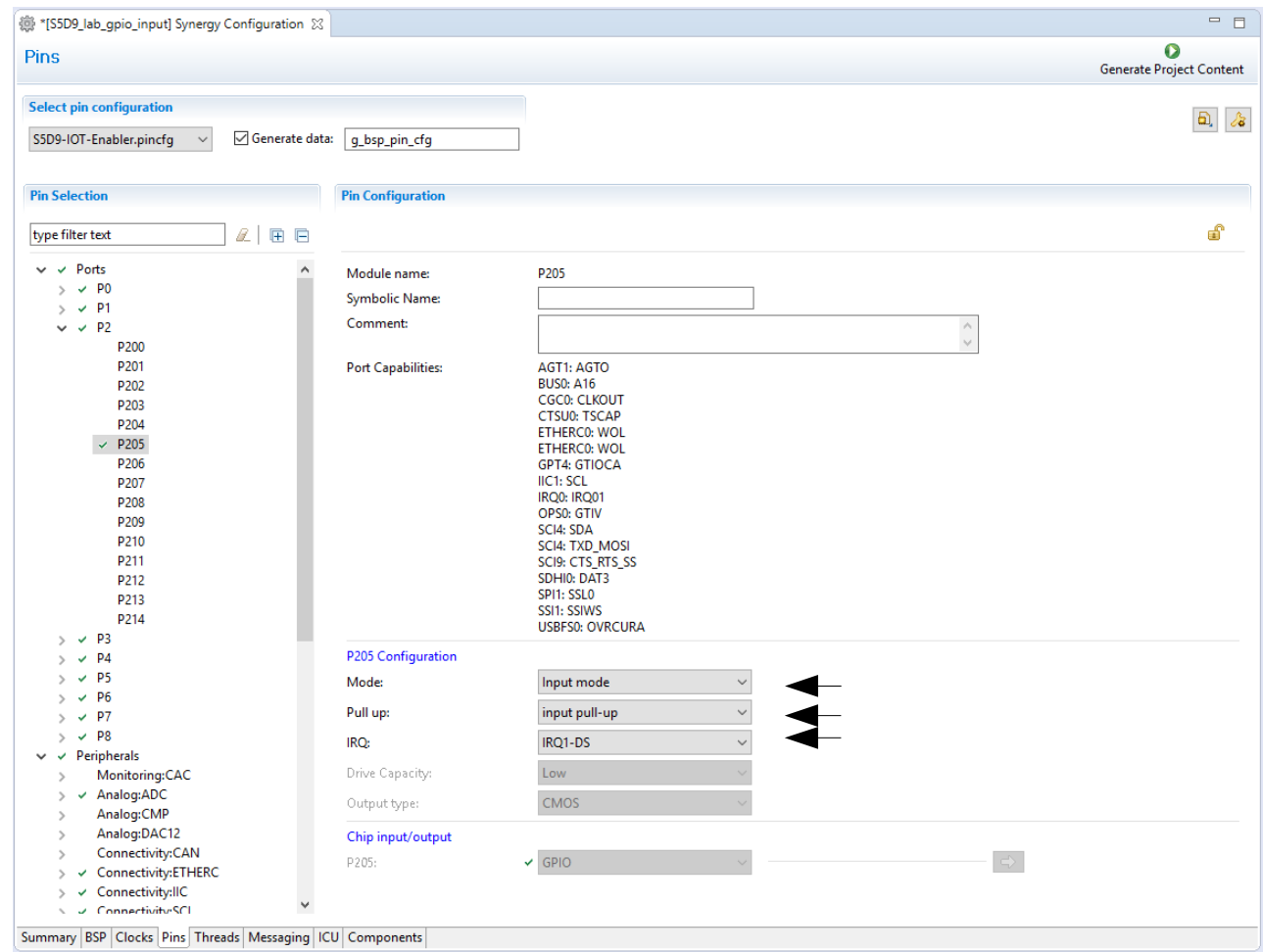
# Hardware Setup



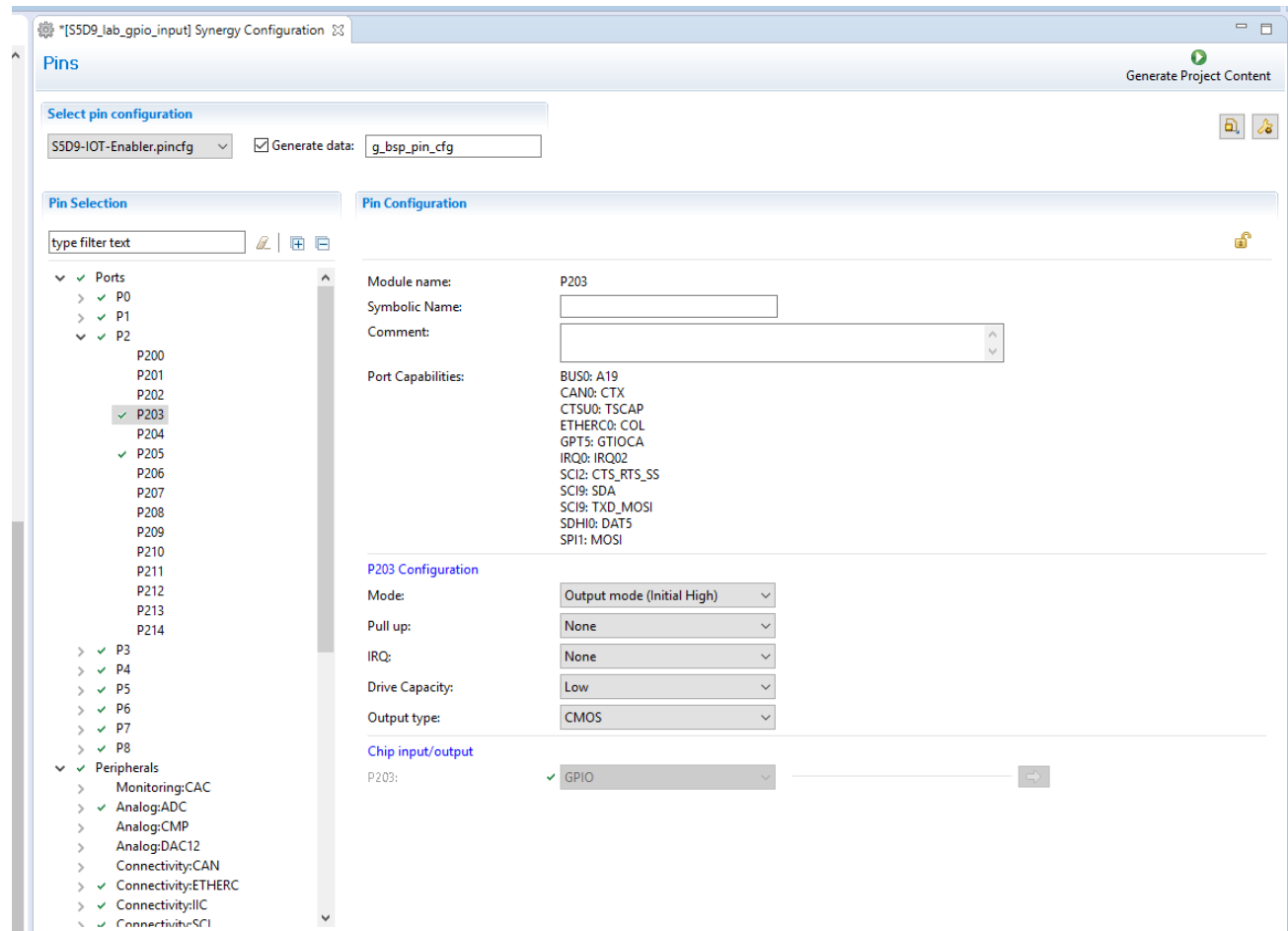
# Disable SPI1



# PMOD pin 1 P2\_5 Input IRQ01 with internal pullup



# PMOD pin 2 P2\_3 output LED



# Setup Timer Interrupt

**Project Explorer**

- 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\_lab\_gpio\_input
- Includes

**Threads**

- HAL/Common
  - g\_ioport I/O Port Driver on r\_ioport
  - g\_elc ELC Driver on r\_elc
  - g\_cgc CGC Driver on r\_cgc ...

**HAL/Common Stacks**

- g\_ioport I/O Port Driver on r\_ioport
- g\_elc ELC Driver on r\_elc
- g\_cgc CGC Driver on r\_cgc
- g\_fmi FMI Driver on r\_fmi
- g\_external\_irq0 External IRQ Driver on r\_icu

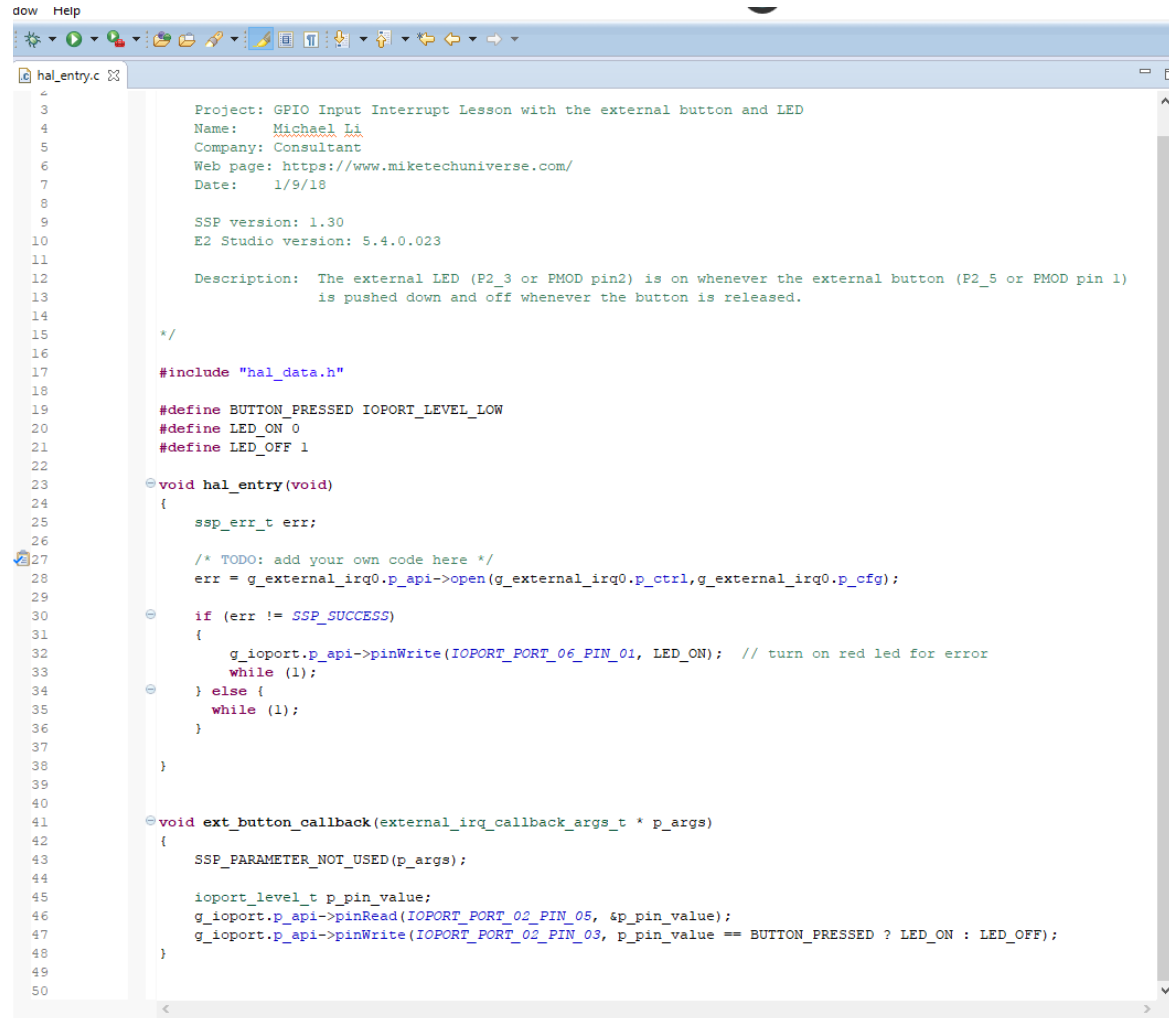
**Properties**

Property	Value
Common	
Parameter Checking	Default (BSP)
Module g_external_irq0 External IRQ Driver on r_icu	
Name	g_external_irq0
Channel	1
Trigger	Both Edges
Digital Filtering	Disabled
Digital Filtering Sample Clock (Only valid when digital filtering is enabled)	PCLK / 64
Interrupt enabled after initialization	True
Callback	ext_button_callback
Interrupt Priority	Priority 8 (CM4: valid, CM0+: invalid)

**Workspace Log**

Message	Plug-in	Date
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:59 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:59 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:54 PM
Indexed "SSD9_lab_gpio_input" (20 sources, 80 head) on eclipse.cdt.com	com.renesas.cdt.debug.ioview.dsf	1/15/18, 4:54 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:54 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:54 PM
Removing model state for session 1	com.renesas.cdt.debug.ioview.dsf	1/15/18, 4:26 PM
Saving model state for session 1	com.renesas.cdt.debug.ioview.dsf	1/15/18, 4:26 PM
Loading Io Map: C:\Renesas\e2_studio540_ssp130...	com.renesas.cdt.debug.ioview.dsf	1/15/18, 4:25 PM
Creating new Model for gdb[1].proc[1].threadGroup	com.renesas.cdt.debug.ioview.dsf	1/15/18, 4:25 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:23 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:23 PM
Input file not found: "...". Using first of 1 alternatives: com.tasking.util	com.tasking.util	1/15/18, 4:23 PM

# Main Code



```
hal_entry.c
3
4 Project: GPIO Input Interrupt Lesson with the external button and LED
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: The external LED (P2_3 or PMOD pin2) is on whenever the external button (P2_5 or PMOD pin 1)
14 is pushed down and off whenever the button is released.
15
16 */
17 #include "hal_data.h"
18
19 #define BUTTON_PRESSED IOPORT_LEVEL_LOW
20 #define LED_ON 0
21 #define LED_OFF 1
22
23 void hal_entry(void)
24 {
25     ssp_err_t err;
26
27     /* TODO: add your own code here */
28     err = g_external_irq0.p_api->open(g_external_irq0.p_ctrl, g_external_irq0.p_cfg);
29
30     if (err != SSP_SUCCESS)
31     {
32         g_ioport.p_api->pinWrite(IOPORT_PORT_06_PIN_01, LED_ON); // turn on red led for error
33         while (1);
34     } else {
35         while (1);
36     }
37 }
38
39
40
41 void ext_button_callback(external_irq_callback_args_t * p_args)
42 {
43     SSP_PARAMETER_NOT_USED(p_args);
44
45     ioport_level_t p_pin_value;
46     g_ioport.p_api->pinRead(IOPORT_PORT_02_PIN_05, &p_pin_value);
47     g_ioport.p_api->pinWrite(IOPORT_PORT_02_PIN_03, p_pin_value == BUTTON_PRESSED ? LED_ON : LED_OFF);
48 }
49
50
```



# C1=button, c2=led

