Interrupts
1.0

Features

- Enables GPIO interrupts
- Clears pending interrupts
- Explains use of interrupt priority and nested interrupts
- Sets up custom ISR

General Description

This example project demonstrates the basic operation of interrupts: setup and enable interrupts, generate a GPIO interrupt, set and change the interrupt priority. The project shows users how they can set up a custom interrupt and configure it as a nested interrupt, change the interrupts priority, clear pending interrupts, and generate a GPIO interrupt.

Development kit configuration

This example project is designed to run on the CY8CKIT-042 kit from Cypress Semiconductor. A description of the kit, along with more example programs and ordering information, can be found at http://www.cypress.com/go/cy8ckit-042.

The project requires configuration settings changes to run on other kits from Cypress Semiconductor. Table 1 is the list of the supported kits. To switch from CY8CKIT-042 to any other kit, change the project's device with the help of Device Selector called from the project's context menu.

Table 1. Development Kits vs Parts

Development Kit	Device
CY8CKIT-042	CY8C4245AXI-483
CY8CKIT-040	CY8C4014LQI-422
CY8CKIT-042-BLE	CY8C4247LQI-BL483
CY8CKIT-044	CY8C4247AZI-M485
CY8CKIT-046	CY8C4248BZI-L485
CY8CKIT-030	CY8C3866AXI-040
CY8CKIT-050	CY8C5868AXI-LP035
CY8CKIT-001	CY8C3866AXI-040 / CY8C5868AXI-LP035
CY8CKIT-041	CY8C4045AZI-S413 / CY8C4146AZI-S433
CY8CKIT-048	CY8C4A45LQI-483

The pin assignments for the supported kits are in Table 2.

Table 2. Pin Assignment

Pin Name	Development Kit							
	CY8CKIT-042	CY8CKIT-040	CY8CKIT-042 BLE	CY8CKIT-044	CY8CKIT-046	CY8CKIT-030	CY8CKIT-050	CY8CKIT-001**
LED_Isr	P0[2]	P1[1]	P3[6]	P2[6]	P5[3]	P6[2]	P6[2]	P1[7]
LED_Nested	P1[6]	P3[2]	P2[6]	P0[6]	P5[2]	P6[3]	P6[3]	P2[7]
Pin_Sw	P0[7]	P0[0]*	P2[7]	P0[7]	P0[7]	P6[1]	P6[1]	P0[0]

Table 2. Pin Assignment (continuous)

Pin Name	Development Kit	
	CY8CKIT-041	CY8CKIT-048
LED_Isr	P2[6]	P2[6]
LED_Nested	P3[4]	P1[4]
Pin_Sw	P0[7]	P0[3]

* CY8CKIT-040 kit does not have an integrated onboard switch, use external.

** For the CY8CKIT-001 kit: connect P1[7] (LED_Isr) to P14 (LED1); connect P2[7] (LED_Nested) to P14 (LED4); connect P0[0] (Pin_Sw) to P14 (SW2). In the Workspace Explorer window, double-click the project's design-wide resource file and assign the pins according to Table 2.

The following steps should be performed to observe the project operation:

1. Build the project and program the hex file into the target device.
2. Power cycle the device and observe the results on the LEDs.

Project Configuration

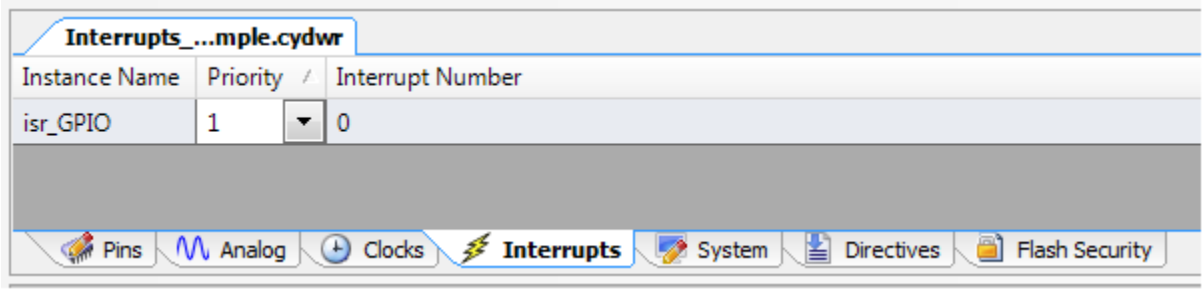
The example project consists of the Interrupt and pin components. The custom interrupt is a part of the cy_boot component.

Pin_Sw is configured to generate an interrupt every time when the button (SW2 or SW1) [1] is unpressed.

Isr_GPIO has changed the priority from the default value (3) to 1 (Figure 1).

Figure 1. Priority of isr_GPIO Interrupt in Design-Wide Resource (Interrupts Tab)

[1] For **CY8CKIT-041** and **CY8CKIT-048** the button is labeled **SW1** and for other kits **SW2**.



Project Description

At the beginning of the main function, a GPIO interrupt is set up and enabled. After that, the initial priority for the GPIO interrupt is changed from 1 to 3 (DEFAULT_PRIORITY). The custom interrupt (nested) is configured (sets up, sets priority) and enabled. In GPIOIsrHandler, the isr_GPIO pending interrupt clears, the pin interrupt clears, the green LED turns on, the nested software interrupt occurs after approximately a 1 second delay, the green LED turns off. In NestedIsrHandler, the software interrupt clears, the red LED turns on for approximately 1 second, the red LED turns off, a delay of approximately 1 second occurs.

Expected Results

Program the device with the project. Press button (SW2 or SW1)[1], the green LED turns on. After 1 second delay, the red LED blinks for 1 second (the yellow color lights when green and red mix), the green LED turns off. After button is pressed, the described above sequence repeats.

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