Digital Pins

1.10

Features

- Digital Input pin with interrupt
- Resistive pull-up drive mode input pin for mechanical switch
- Digital output pin with hardware connection
- Software driven digital output pin

General Description

The Pins component is an essential part of most embedded designs. This example project is a simple demonstration of how to use digital input and digital output pins in a generic design. The digital input pin is used to interface with a mechanical switch and provides the input stimulus to the design. A hardware digital output pin and a software digital output pin are used to show how the input stimulus can be used in the design and also demonstrate the two most common ways of driving digital output signals.

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-001	CY8C3866AXI-040 / CY8C5868AXI-LP035
CY8CKIT-042	CY8C4245AXI-483
CY8CKIT-042-BLE	CY8C4247LQI-BL483
CY8CKIT-044	CY8C4247AZI-M485
CY8CKIT-046	CY8C4248BZI-L489

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

Table 2. Pin Assignment

Pin Name	Development Kit				
	CY8CKIT-001**	CY8CKIT-042	CY8CKIT-042 BLE	CY8CKIT-044	CY8CKIT-046
InputPin	P6[1]	P0[7]	P2[7]	P0[7]	P0[7]
OutputPinHW	P6[2]	P1[6]	P2[6]	P0[6]	P5[2]
OutputPinSW	P6[3]	P0[2]	P3[6]	P2[6]	P5[3]

The OutputPinHW pin is connected to the Red LED on the kit.

The OutputPinSW pin is connected to the Green LED on the kit.

** The CY8CKIT-001 kit requires manual connections to the following resources:

- Connect P6[1] to SW2.
- Connect P6[2] to LED1
- Connect P6[3] to LED2

Project Configuration

InputPin is configured as a HW connection Digital Input with Resistive Pull Up drive mode. It is configured to generate an interrupt (port wide) when both rising and falling edge transitions are detected. InputInterrupt is connected to InputPin's irq terminal.

OutputPinHW is configured as a HW connection Digital Output with Strong Drive.

OutputPinSW is configured as a Digital Output with HW connection checkbox unchecked. The drive mode for this pin is also Strong Drive.

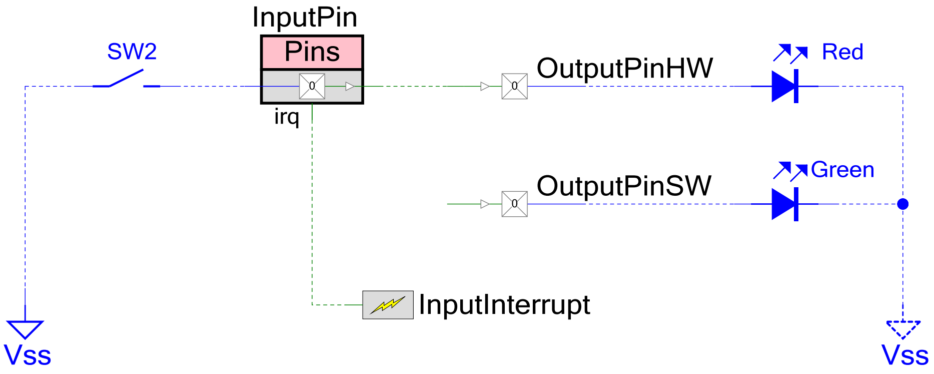

Figure 1. TopDesign Schematic

The blue connections are annotation only and show the external connections as instructed in the Development Kit Configuration section. These connections are needed only for the CY8CKIT-001 kit.

Project Description

InputPin is a hardware controlled digital input pin used to provide a means of getting external stimulus into the design. In this project, it is used get the state of the mechanical switch press on SW2. To avoid a floating state on the pin, it is configured as a Resistive Pull Up drive mode which inserts a pull up resistor on the pin. The pin is also configured to generate an interrupt[1] at both rising and falling edges of the input signal.

OutputPinHW is connected directly to Input Pin as it is configured as a hardware connection digital output pin. This allows InputPin to be connected to OutputPinHW through internal routing and will pass the signal from InputPin to OutputPinHW.

OutputPinSW is software controlled digital output pin, which means that it does not expose a terminal in its symbol on the schematic and can only be configured by register writes through software. The state of this pin is controlled in the ISR of InputInterrupt. The interrupt triggers on either edges of InputPin. In the ISR, when the signal on InputPin is logic 1 then the OutputPinSW generates logic 0 on its output. It does the opposite when InputPin has logic 0.

Expected Results

CY8CKIT-042

Red LED should be on and Green LED should be off when the mechanical switch SW2 is not pressed. When it is pressed then Red LED should turn off and Green LED should turn on.

CY8CKIT-042-BLE, CY8CKIT-044

Green LED should be on and Red LED should be off when the mechanical switch SW2 is not pressed. When it is pressed then Green LED should turn off and Red LED should turn on.

Example Project Changes

This section lists the changes in the example project from the previous version.

Version	Description of Changes
1.10	Added support for PSoC 4100-M / PSoC 4200-M
1.0	Initial Release

[1] Note that the interrupt is generated through the Port Interrupt Controller Unit (PICU) and is port wide. Therefore if any other pin on this port is configured to generate an interrupt then it will also activate this interrupt.

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