

TCPWM (Timer / Counter mode) example project

3.0

Features

- TCPWM component configured as Timer/Counter
- Underflow (Terminal Count) interrupt blinks LED
- Capture-interrupt selects which LED to blink

General Description

This example project demonstrates the usage of the TCPWM component configured as Timer/Counter with two interrupts enabled: Capture and Underflow (Terminal Count).

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-L489
CY8CKIT-041	CY8C4045AZI-S413 / CY8C4146AZI-S433
CY8CKIT-048	CY8C4A45LQI-483

The pins assignment for the supported kits is in Table 2.

Table 2. Pins Assignment

Pin Name	Development Kit						
	CY8CKIT-042	CY8CKIT-040	CY8CKIT-042 BLE	CY8CKIT-044	CY8CKIT-046	CY8CKIT-041	CY8CKIT-048
LED_GREEN	P0[2]	P1[1]	P3[6]	P2[6]	P5[3]	P2[6]	P2[6]
LED_BLUE	P0[3]	P0[2]	P3[7]	P6[5]	P5[4]	P3[6]	P1[6]

CaptureSource	P2[0]	P2[0]	P2[0]	P2[0]	P2[0]	P2[0]	P2[0]
CaptureInput	P0[1]	P0[1]	P0[1]	P0[1]	P0[1]	P0[1]	P4[0]

To observe the project operation, perform the following steps:

1. Connect P2[0] to P0[1] to connect the Capture Source and Capture Input.
2. Build the project and program the hex file on to the target device.
3. Power on the device and observe the blinking LED change the color upon every Capture interrupt.

Project configuration

The example project consists of the following components: TCPWM, Clock, three digital output pins, digital input pin, and interrupt. The TCPWM is used as the Down Timer with the Capture mode in the Continuous Run mode. One output pin is used for the Capture signal generation (could be replaced with the user switch). That output CaptureSource pin should be connected to the CaptureInput pin with a wire. Two output pins are used to control the LEDs reflecting the Underflow (Terminal Count) and Capture events.

Project description

In the project, TCPWM counts the value from 65000u down to 0u. When the counter reaches the zero value, an interrupt happens and the active LED toggles. Every 3 seconds, the CaptureSource signal generates a pulse causing a Capture interrupt and the LED color then toggles between blue and green.

Expected results

The LED blinks once per second, and toggles upon the Underflow (Terminal Count). The LED color changes once every 3 seconds when a Capture interrupt occurs. If we disconnect the wire between CaptureSource and CaptureInput, and connect the CaptureInput to GND, the Capture interrupt won't be generated and the LED will blink with the same color. Alternatively, the user switch can be connected to CaptureInput to change the color upon each button press (CaptureInput drive mode must be changed to Resistive Pull-Up).



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