System Tick Timer
1.0

Features

- System timing in milliseconds, seconds, and minutes
- Non-blocking system timer

General Description

This example project demonstrates the basic operation of System Tick Timer: general purpose timing control in applications that do not have a dedicated timer/counter.

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-050	CY8C5868AXI-LP035
CY8CKIT-001	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-050	CY8CKIT-001***
LED_Sec	P0[3]	P0[2]	P3[7]	P6[5]	P5[4]	P6[2]	P1[7]
LED_Min	P1[6]	P3[2]	P2[6]	P0[6]	P5[2]	P6[3]	P2[7]
\UART:tx\	P0[5]*	P0[5]*	P1[5]	P7[1]	P3[1]	P3[7]**	P0[0]

Table 2. Pin Assignment (continuous)

Pin Name	Development Kit	
	CY8CKIT-041	CY8CKIT-048
LED_Sec	P3[6]	P1[6]
LED_Min	P3[4]	P1[4]
\UART:tx\	P0[5]	P0[5]

* Connect P0[5] (\UART:tx\) to J8 pin 9 (PSoC 5LP P12[6]) for CY8CKIT-040, CY8CKIT-042.

** Connect P3[7] (\UART:tx\) to P5 (TX) for CY8CKIT-050. Check J37 is shorted.

*** For the CY8CKIT-001 kit: Connect P1[7] (LED_Ok) to P14 (LED1); connect P2[7] (LED_Error) to P14 (LED4); connect P0[0] (\UART:tx\) to P16 (TX) for CY8CKIT-001. Check J10 is shorted.

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

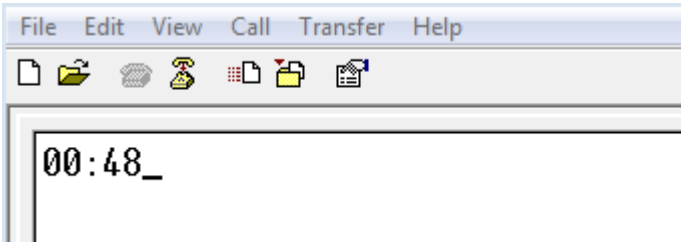
1. Set Jumper to 3.3V position.
2. Connect a USB cable to the PSoC 4 Pioneer Kit DVK and PC with the HyperTerminal program.
3. For CY8CKIT-040 change the clock configuration. In the Workspace Explorer window, double-click the project's design-wide resource file and click on the Edit Clocks icons on the Clocks tab. Select IMO (32.000 MHz) in the Direct_Sel box and Direct_Sel (IMO 32.000 MHz) in the HFCLK box.

Projects Description

In the main function, SysTick is started and a callback function that is called on a SysTick interrupt is set. This callback function handles a millisecond counter and once per second sets a flag for the main code. The "for" loop in main.c checks the flag, and if set, processes seconds, minutes, and prints the system time to UART. The blue and red LEDs toggle at a second and minute rate correspondingly.

Expected Results

After programming the SysTick_Example project, the onboard blue LED should toggle each second and the red LED should toggle each minute. HyperTerminal displays the current system time since startup in format MM:SS as shown in the figure below.



Using UART to communicate with PC Host

This example project communicates with a PC host using UART. A HyperTerminal program is required in the PC to communicate with PSoC. If you don't have a HyperTerminal program installed, download and install any serial port communication program. Freeware such as HyperTerminal, Bray's Terminal etc. is available on the web.

Follow these steps to communicate with the PC host.

1. Connect a USB cable between the PC and PSoC 4 Pioneer Kit (connect a RS-232 cable between the PC and PSoC 5LP Kit).
2. Open the device manager program in your PC, find the COM port to which the PSoC is connected, and note the port number.
3. Open the HyperTerminal program and select the COM port to which the PSoC is connected.
4. Set the baud rate of 115200 bps in the HyperTerminal configuration window to match the configuration of the PSoC Creator UART component in the project.
5. Start communicating with the device as explained in the project description.

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