PSoC 4 Watchdog Example Project
1.0

Features

- Displays RTC time
- RTC alarm functionality
- WDT as sleep wakeup source
- DST feature
- Sends Date and Time over UART
- Demonstrates method how to start WCO in parallel with other user code to save time and power
- Periodic interrupt generation by WDT with WCO clock source

General Description

This example project demonstrates the basic operation of the RTC: set/get the current Date/Time, use the DST feature, and use the alarm feature. The project sends Date and Time and the alarm status over UART, uses the device in the sleep mode and wakes it up only to service ISR, shows users how they can perform the WCO start-up and RTC initialization in parallel.

Development kit configuration

This example project is designed to run on the CY8CKIT-042-BLE 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-BLE.

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-BLE	CY8C4247LQI-BL483
CY8CKIT-044	CY8C4247AZI-M485
CY8CKIT-046	CY8C4248BZI-L489

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

Table 2. Pin Assignment

Pin Name	Development Kit		
	CY8CKIT-042 BLE	CY8CKIT-044	CY8CKIT-046
LED_WdtIsr	P2[6]	P0[6]	P5[2]
LED_Alarm	P3[7]	P6[5]	P5[4]
UART:tx	P1[5]	P7[1]	P3[1]
LFCLK_Out	P0[0]	P0[0]	P0[0]

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

1. The kit board should be configured to the default switch and jumper settings.
2. Connect the Pioneer kit board to a PC using a USB cable.
3. Launch any of the RS-232 terminal applications on the PC and configure it to use the ‘KitProg USB-UART’ port with the speed of 115200bps.
4. Build the project and program the hex file into the target device.
5. Observe the results on the terminal application and on the LEDs.
6. Observe stable LFCLK output on the LFCLK_Out pin.

Project Configuration

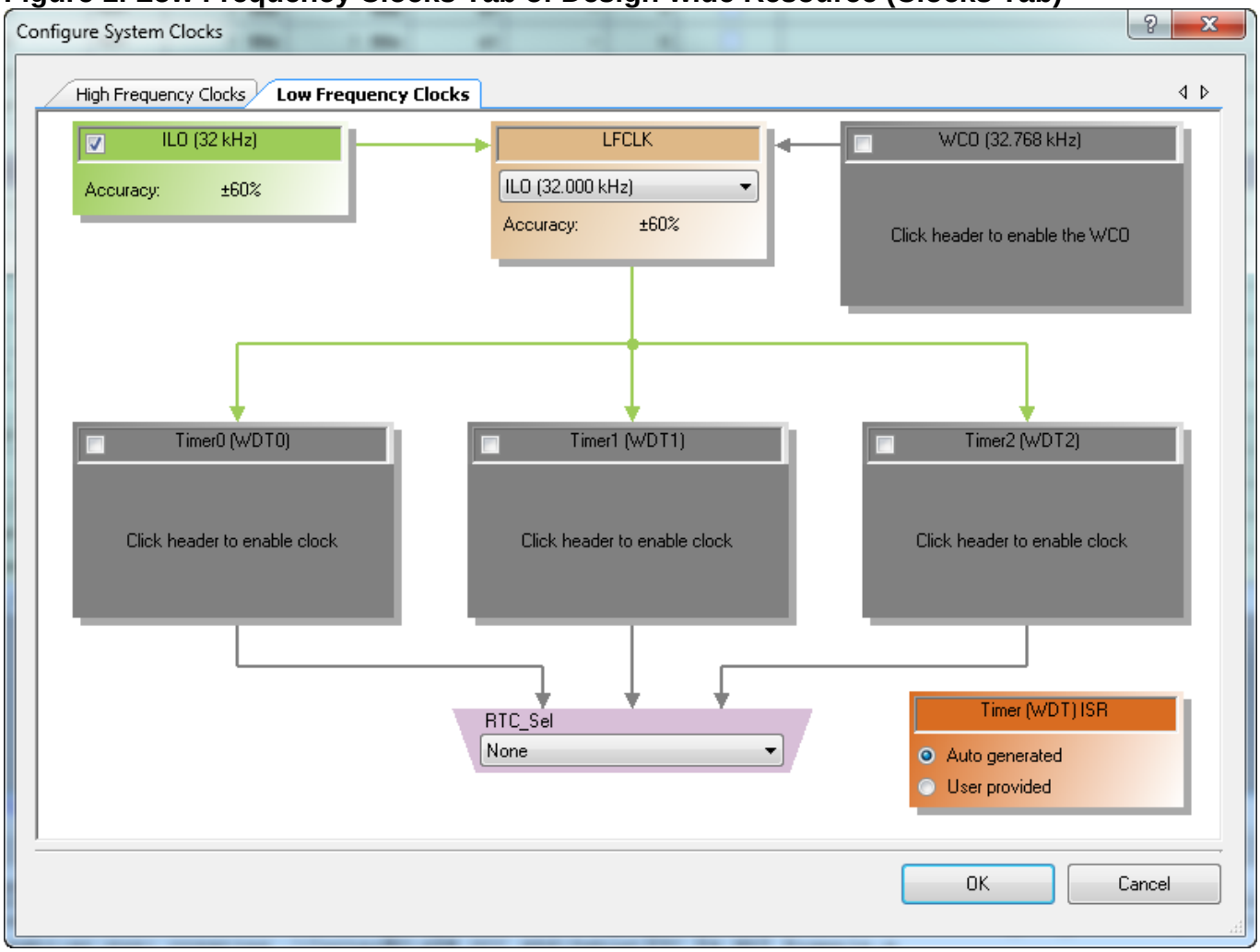
The example project consists of RTC, Global Signal Reference, UART, Pin, components. WDT API is a part of the cy_lfclk component.

WDT counter configuration implemented in the main.c file.

The UART component is used to send Date and Time, and the alarm status after a startup on HyperTerminal.

The pins are used to show (by pin toggling) WDT interrupt generation, RTC Alarm happening and to control the LFCLK output.

Figure 1. Low Frequency Clocks Tab of Design-wide Resource (Clocks Tab)



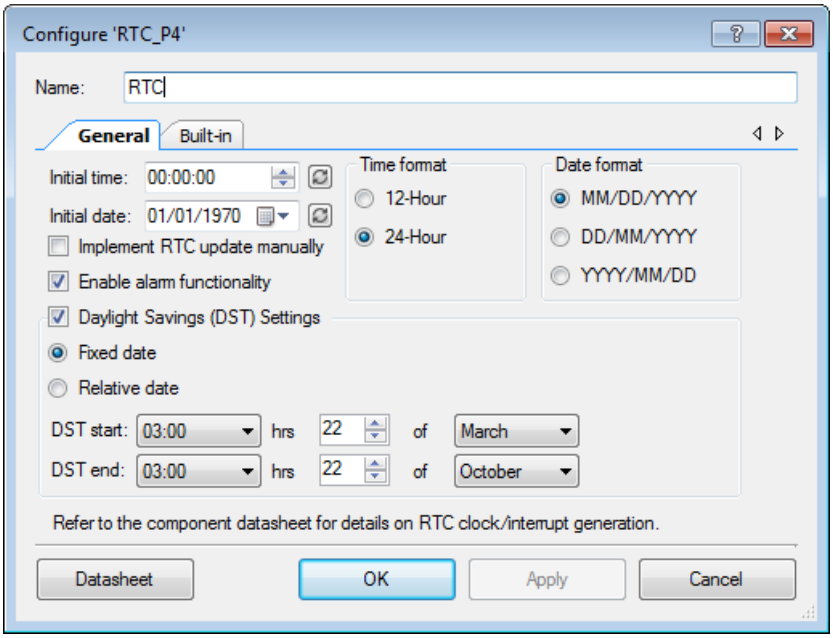
Project Description

At the beginning of the main function, the alarm structure is initialized, WDT counter 2 is enabled, alarm Date and Time are set using API, the current Date and Time are set using API, “ignore” for the second alarm mask is set. In the cycle Date and Time are obtained from RTC and printed with the alarm status to UART. After that, the device goes to the deep sleep mode. In ISR, the WDT interrupt is cleared, RTC updates and the red LED is toggled. In the alarm handler, the alarm status is cleared and the blue LED is toggled.

Expected Results

Program the device with the project and observe that the red LED is toggled every second. The current, Date, Time, and alarm status "02:59:50 | 03/22/2014 | No alarm" are started on PC Host. The Daylight Savings Functionality is configured in GUI (Figure 2) and changes the time to 04:00:00 at 03:00:00. The blue LED is toggled and the alarm status changes to “Alarm” if alarm happens (at 04:01:00 with one minute duration). Stable meander should be observed with scope on P0[0] in time intervals when device is in “Active” mode and no activity when device in “Deep Sleep” mode.

Figure 2. RTC Component Configuration



Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709

Phone : 408-943-2600
Fax : 408-943-4730
Website : www.cypress.com