PsoC 101 Training

Introduction to PsoC 6 and Psoc Creator

Dual Core features of Psoc 6

Hello world program in psoc creator for blinking LED in 3 modes 1. Without CPU 2. From Firmware in M0 core and 3. from M4 core .

Introduction to PDL libraries.

The M0 and M4 cores in Psoc 6 use the same registers and buses allowing for resource sharing between the 2 core. This enable application developers to partition their code to the core that best suits the needs.

RTOS

Free RTOS usage for handling multiple peripherals and communication blocks.

RTOS feature was added by selecting the checkbox for Free RTOS in the Peripheral driver library under the Build settings for the project.

UART  
UART Block code with Free RTOS for sending and receiving commands via tera term.

SCB 5 block was used for UART setup.  
Free RTSO Task was created with semaphores to run UART task on key press. And print a message.

Semaphores are enabled and use for ease of resource sharing between tasks.

Event groups are used to notify observation tasks like ezI2c and BLE of the change in the motor PWM duty cycle which can then be communicated to user.

Message queues are used to communicate the pwm duty cycle percentage between tasks, mainly to communicate the duty cycle to be set from capsense task to the motor control task.

Retarget IO

The peripheral driver library “Retarget io” was enabled in the projects build settings to re route the messages from printf() to UART on SCB5 for displaying the messages in terminal application.

Ez I2C

Basic ez I2C program was developed and same was used to send and retrieve data from the PsoC 6 using the bridge control panel.

Chart feature of Bridge control panel was used to observe the changes in the values retrieved from PsoC using the ezI2C.

The ezI2C feature was integrated into the main controller project to observe the motor speed as a graph in the charts tab of the bridge control panel.

Logical Kill Switch

Implemented a kill switch circuit using top schematic of psoc creator by making use of digital multiplexer, not gates and a t-flipflop to stop pwm’s controlling motor operation.

The kill switch makes use of PWM to blink a red led when enabled and solid green led when disabled by clicking on the user switch sw2 of the pioneer BLE kit.

Capsense

The capsense block was used to develop a basic program to vary the pwm of the signal fed to an rgb led.

Linear slider and 2 buttons were used .

The basic program was integrated into the main controller program where the buttons select the motor to control and the slider to select the pwm duty cycle for the motor in percent from 0 to 100.

The duty cycle is then communicated to the motor control task via message queue for the same to set the duty cycle of the motor to this perncentage.

Bluetooth 5.0  
A basic program to control the brightness of an RGB LED over BLE was developed.Here the firmware was developed for the PSoC 6 device acts as a peripheral device