

## Deep Sleep

My name is Alan Hawse and this is PSoC 101. We just covered sleep mode. In this lesson I will introduce you to Deep Sleep, which is a far more effective power-saving mode of the device. While it saves more power, deep sleep has fewer options for waking up. In sleep mode all the hardware continues to run and any interrupt wakes the device up. Deep sleep shuts down most of the hardware and so those interrupts cannot fire. One exception to that rule is the serial communication blocks, which have an enable wake from deep sleep option in I2C mode. We are going to use that to implement a similar program to the sleep example but you'll see much greater power savings.

Create a new project, again using the pre-populated templates. Edit the I2C component to use the EZ-mode and check the wake up from deep sleep option. You cannot use the UART this time, because the serial bridge is going to be used by I2C, so go to the My Design tab and set up one of the output pins to drive an LED. Make a copy of this component so you can control all three LEDs. All the other tabs can be disabled because we are not using their functionality. In the DWR file, pick the I2C and the RGB pins for your kit.

In C you need to start the I2C and set up the buffer. Make it a single byte buffer that is writable from the master. In the main loop, flash the LED a few times before going into DeepSleep with the `CySysPmDeepSleep` function. One last thing you need to do is to put the I2C into a sleep mode such that its wake from deep sleep option can operate. The component generates two functions for this – `Sleep` and `Wakeup`. These need to be called immediately before and after the call to put the whole device to deep sleep.

There is no timer to wake the part up this time. You will need to go to the Bridge Control Panel and write a byte into the buffer to wake it up.

You'll see a much more impressive power drop when you go into Deep Sleep compared to Sleep. To extend the project use the data written from the control panel to change the amount of time the device is active. Just send a number of seconds and use that number in the `CyDelay` function.

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