

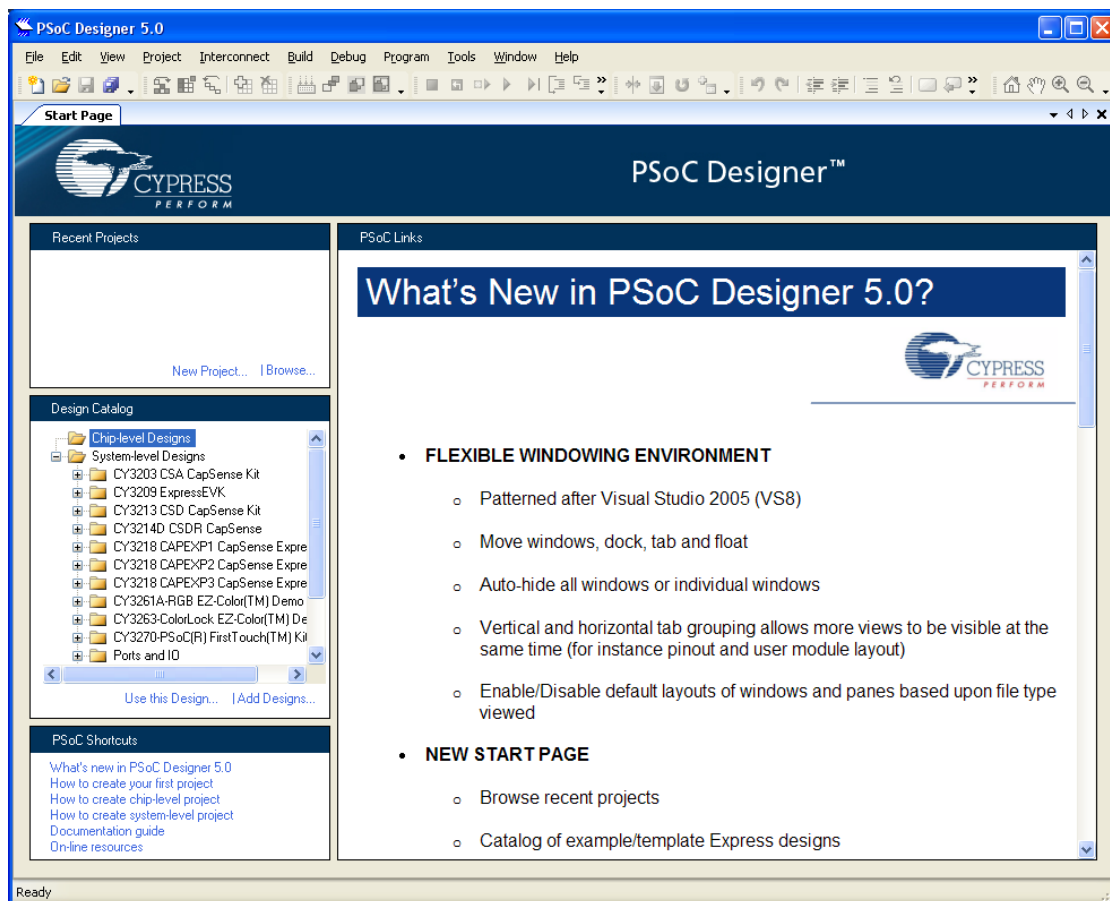
Introduction to PSoC Designer 5 and PSoC Programmer

Abstract

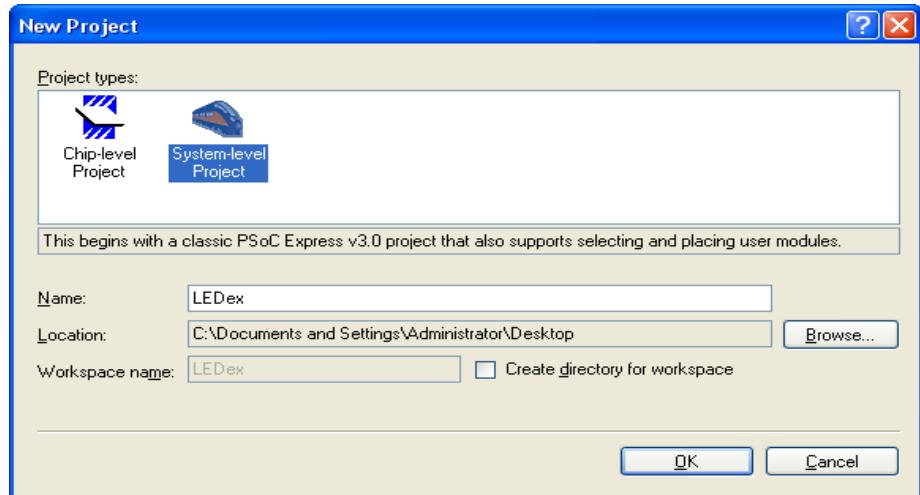
This application note will discuss the introduction to PSoC Designer 5 and PSoC Programmer. These programs are used to design programs and upload them to Cypress microcontrollers. Cypress has developed a visual drag and drop programming environment that is easy to use without the need for an extensive background in programming, which will save time developing programs and debugging them.

Introduction

PSoC Designer 5 is the program used to design your program. When a program has been completed the PSoC Programmer is used to program the microcontroller. PSoC Designer 5 has two types of project designs, system level and chip level. System level programming is a visual drag and drop interface which does not require much coding experience. Chip level programming is a more complex interface that requires much more training and programming experience to use. This application note will only demonstrate how to use the system level view to design a simple program and program it to a Cypress CY3214-PSoCEvalUSB development board. A current version of PSoC designer 5 and PSoC Programmer can be downloaded from www.cypress.com/PSoCDesigner. Once this software package is downloaded and installed it can be accessed from the start menu. Open PSoC designer by clicking Start > Programs > Cypress > PSoC Designer 5. The program should open in the default startup screen shown below:

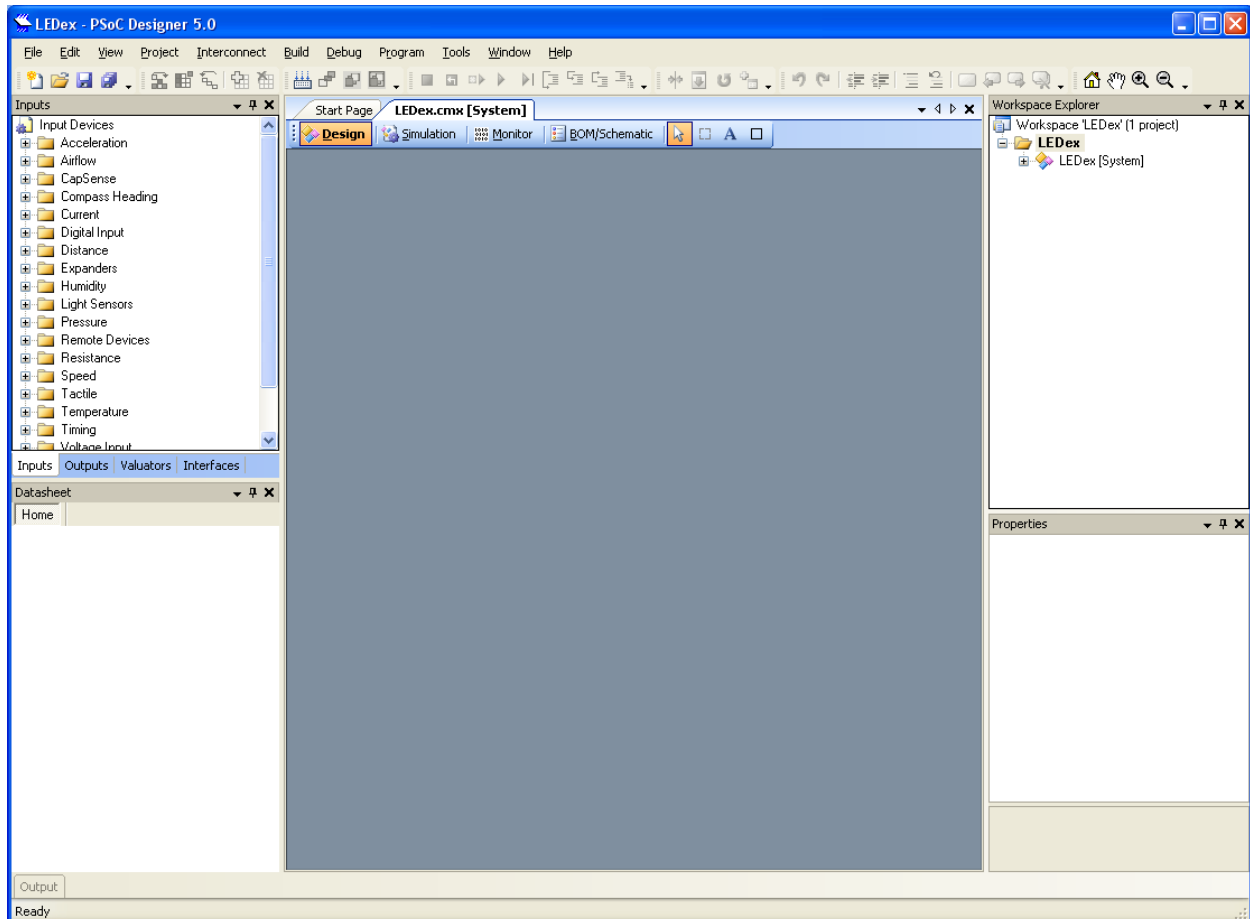


To start a new project select File > New Project. A design selection menu is displayed:



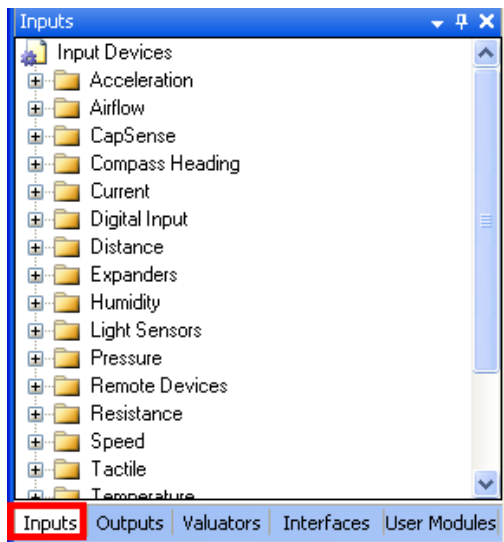
Select system level view and then type LEDex and click OK.

A new project will open as shown here:



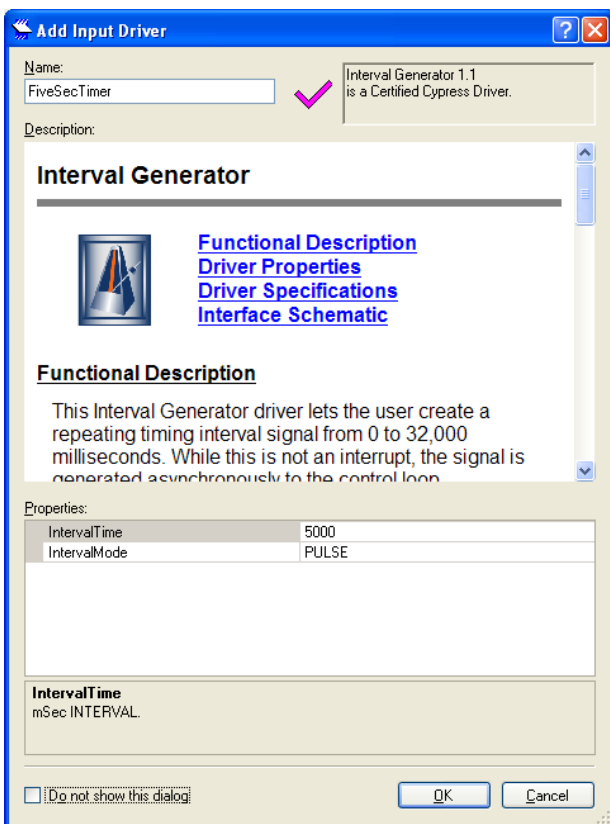
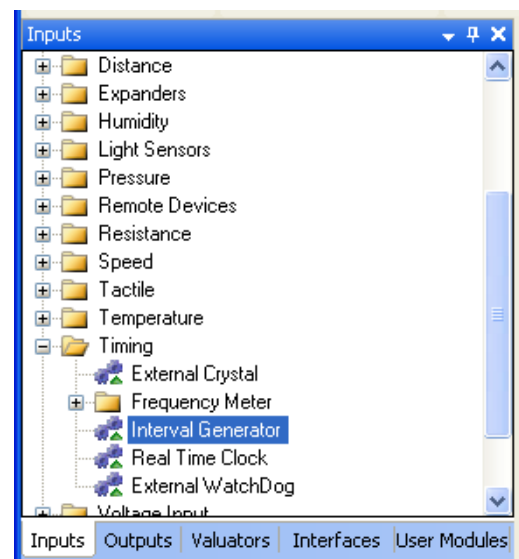
DESIGN

In this LED example project we are going to create a program that will toggle an LED on and off every 5 seconds and also display "LED: ON" or "LED: OFF" on the LCD.



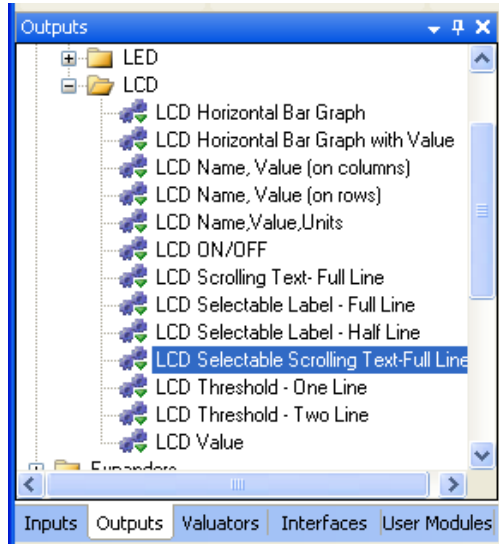
The first step to do this is to go to the Input Catalog by selecting Inputs in the upper left of the project window or select View > Input Catalog. This window displays all the types of inputs the microcontroller can have.

Select Timing > double click Interval Generator.

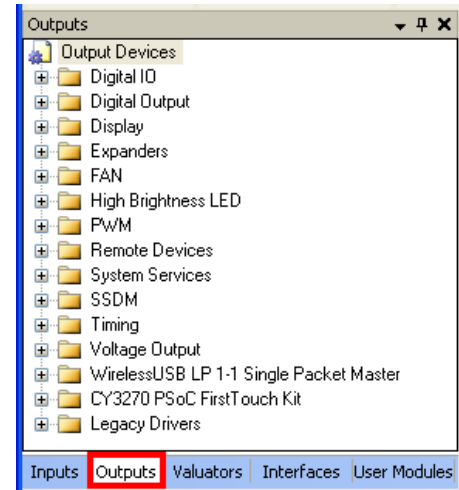


Type FiveSecTimer for the name and for IntervalTime type 5000 for 5 seconds select OK.

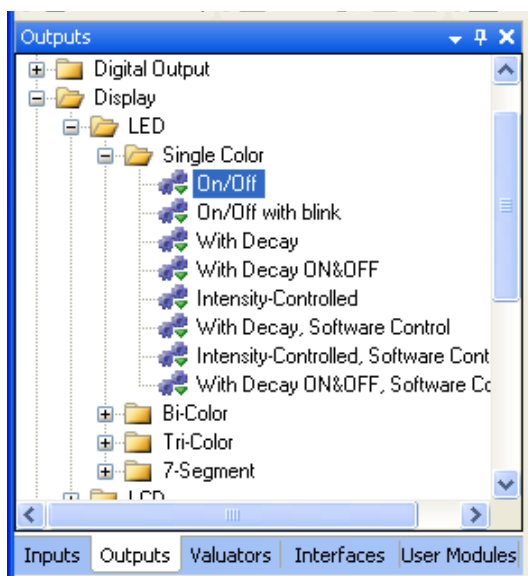
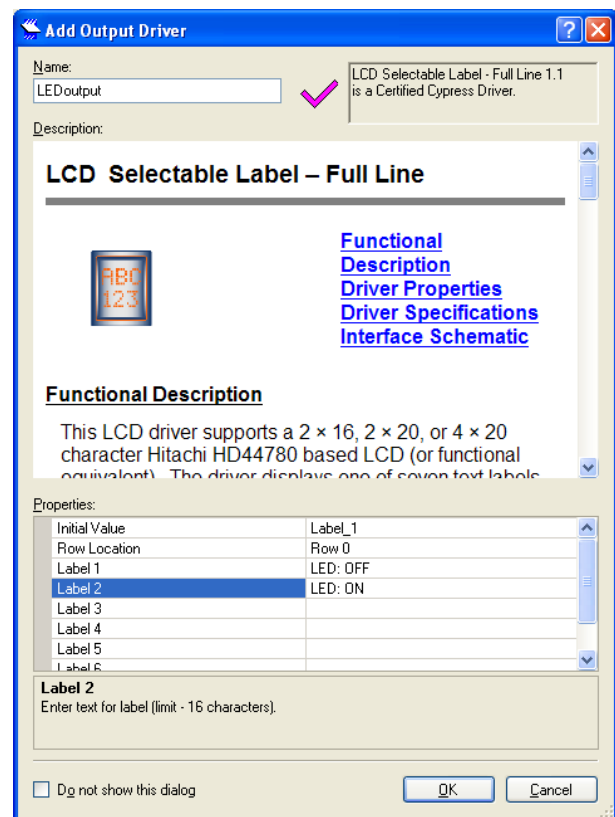
Go to the Output Catalog by selecting Outputs in the upper left of the project window or select View > Output Catalog.



Select Display > LCD > double click LCD Selectable Label – Full Line.

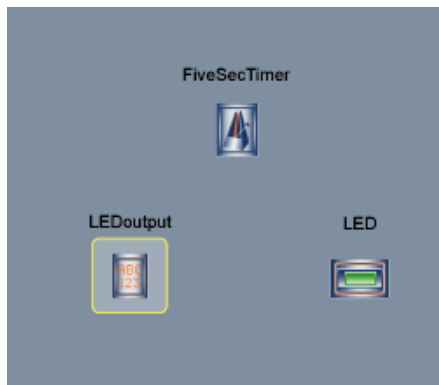
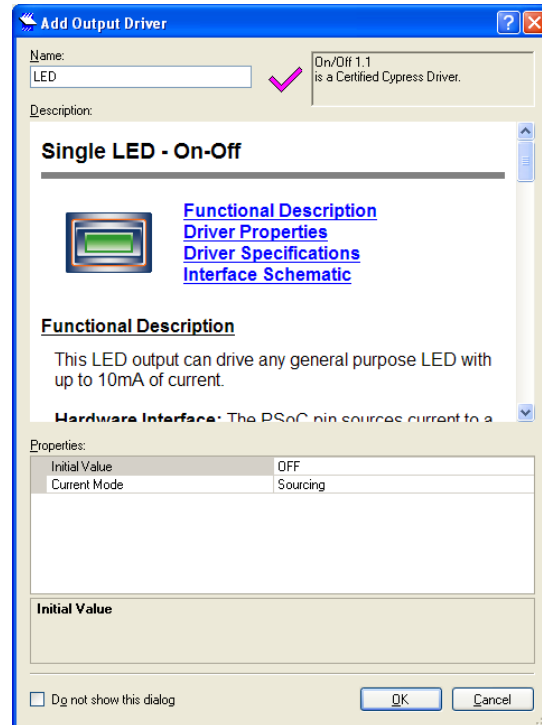


Type LEDOutput for name select Initial Value as Label_1 then type “LED: OFF” for Label 1 and type “Label 2 LED: ON” for Label 2. Click OK.



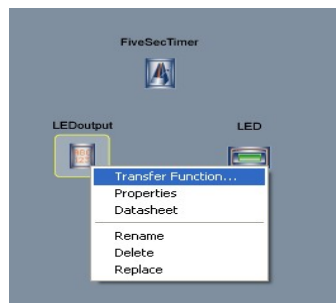
Select Display > LED > Single Color > double click On/Off. Click OK.

Type LED for name and select Initial Value as OFF.
Click OK.

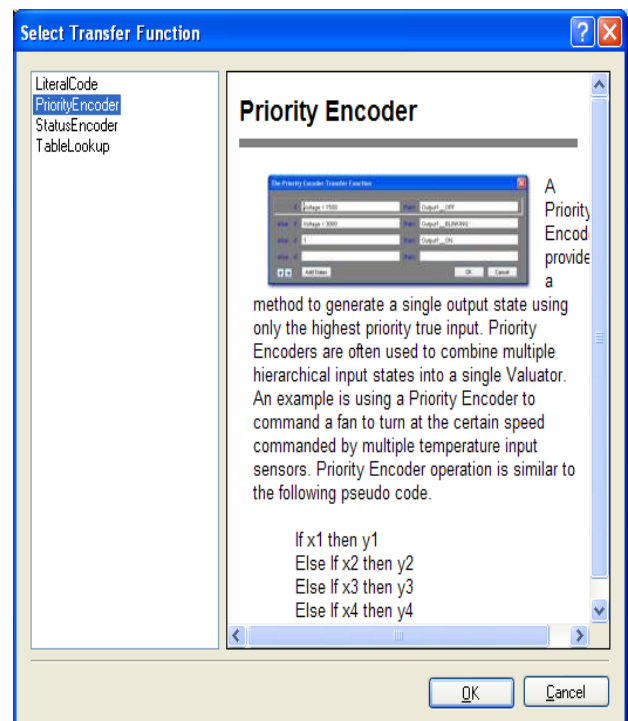


You should now have the 3 components show in the figure to the right that you can place anyway you like.

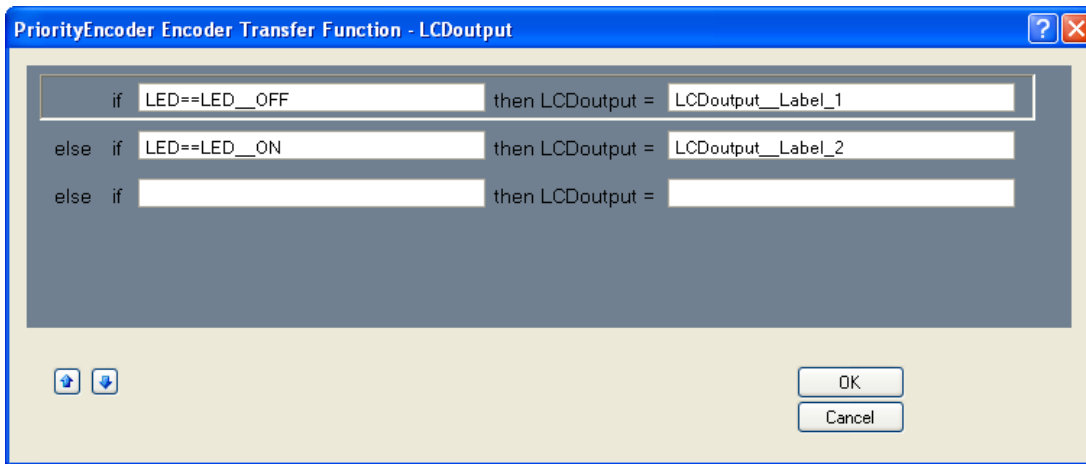
Right click on the LEDOutput component and select Transfer Function from the Menu.



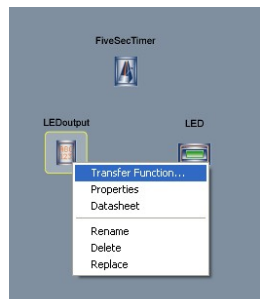
Then select PriorityEncoder from the following dialog box. Click OK.



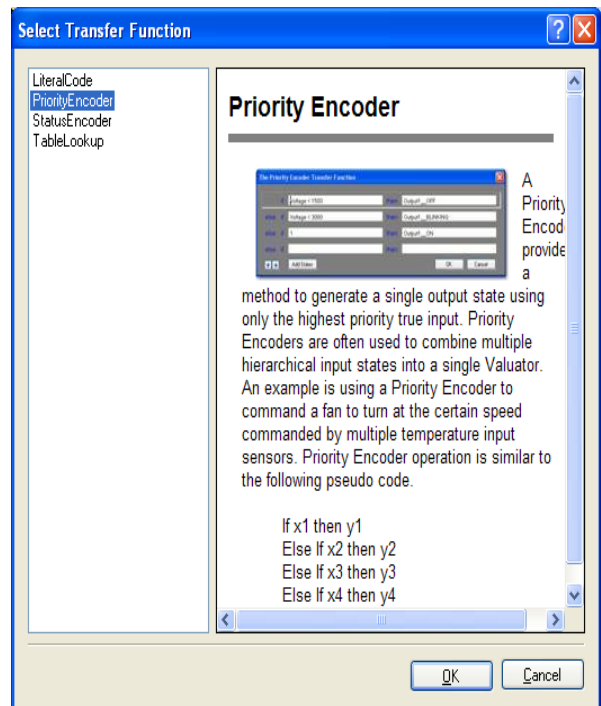
Fill in the following dialog box as show below:



Similarly right click on the LED component and select Transfer Function from the Menu.



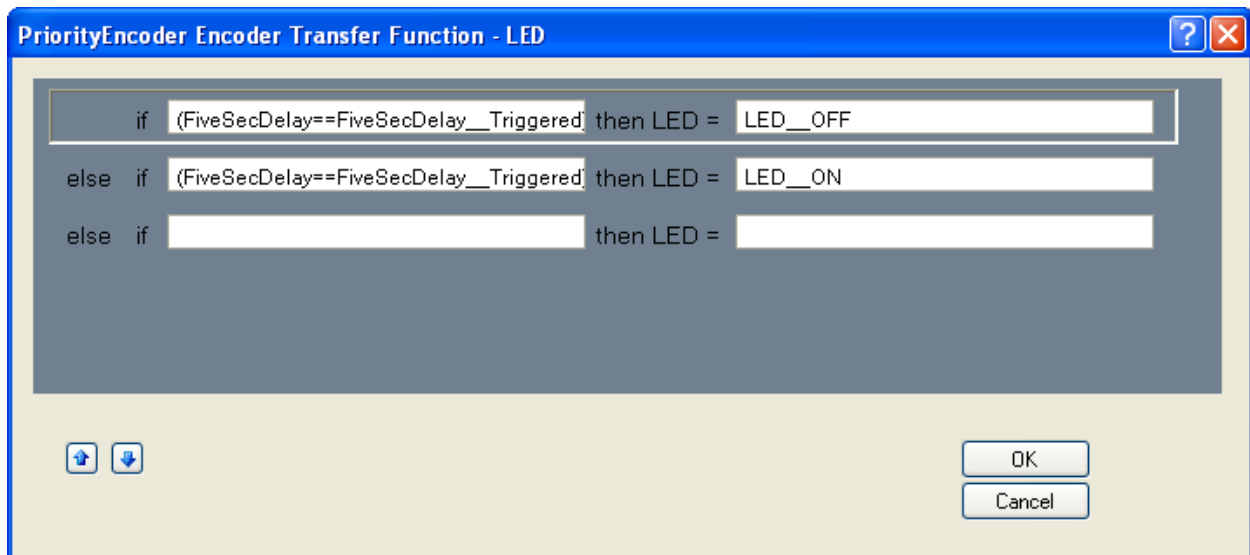
Then select PriorityEncoder from the following dialog box. Click OK.



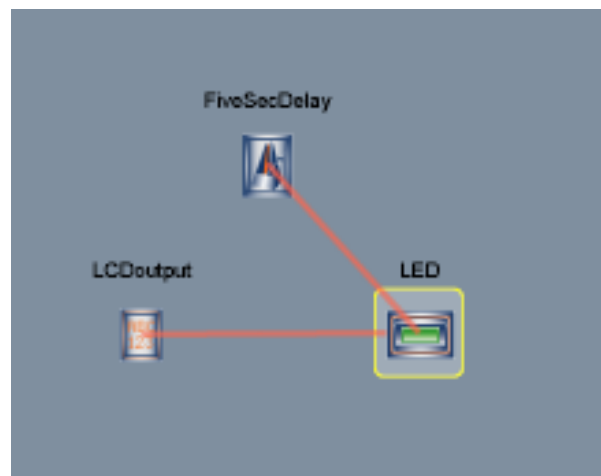
Fill in the following dialog box as show below:

If (FiveSecDelay==FiveSecDelay__Triggered)&&(LED==LED__ON) then LED_OFF

If (FiveSecDelay==FiveSecDelay__Triggered)&&(LED==LED__OFF) then LED_ON

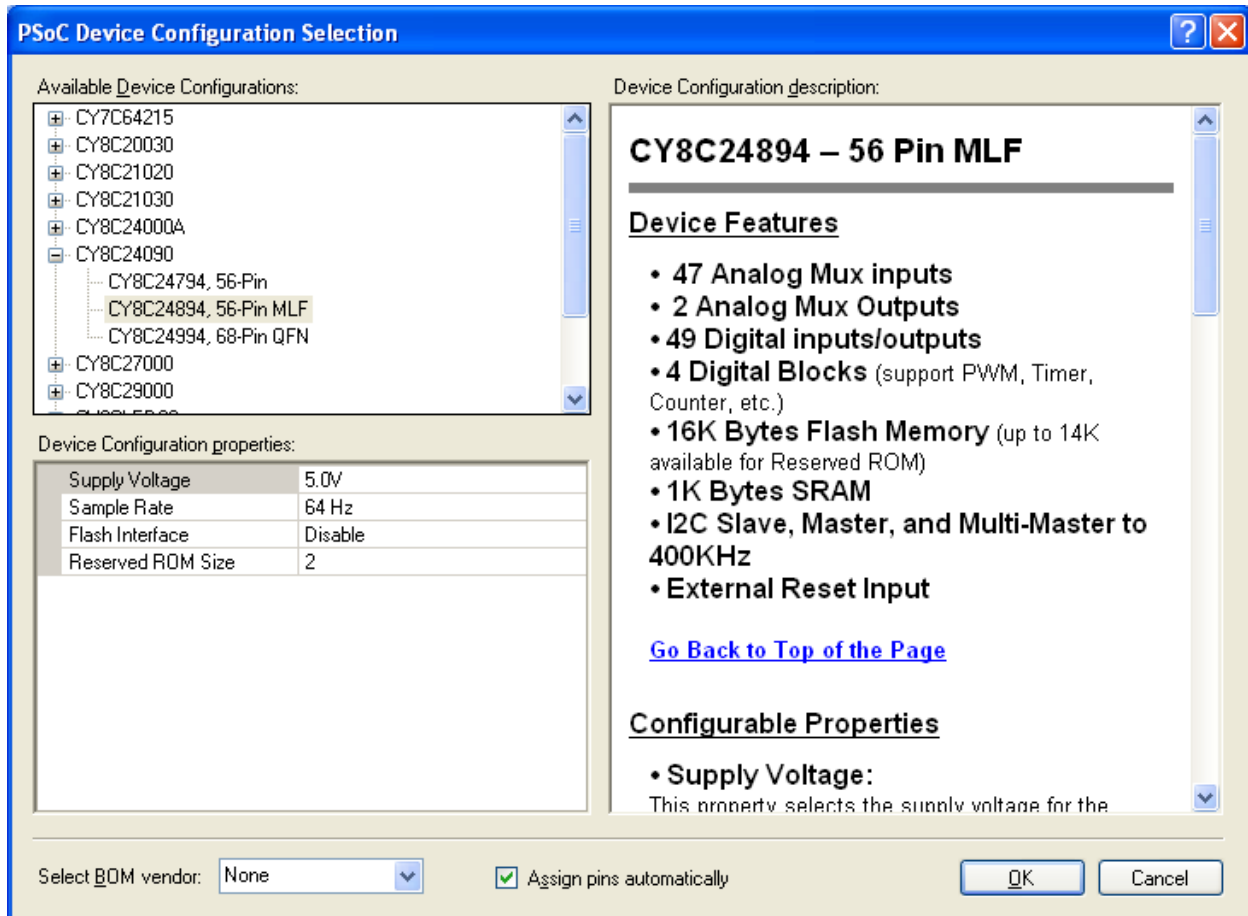


The program design is now complete and should look like this:



Building the Project

Now that the design of the program is finished it is now time to build it. Press F6 or from the menu bar select Build > generate/build "LEDex" Project. The following window will be displayed:

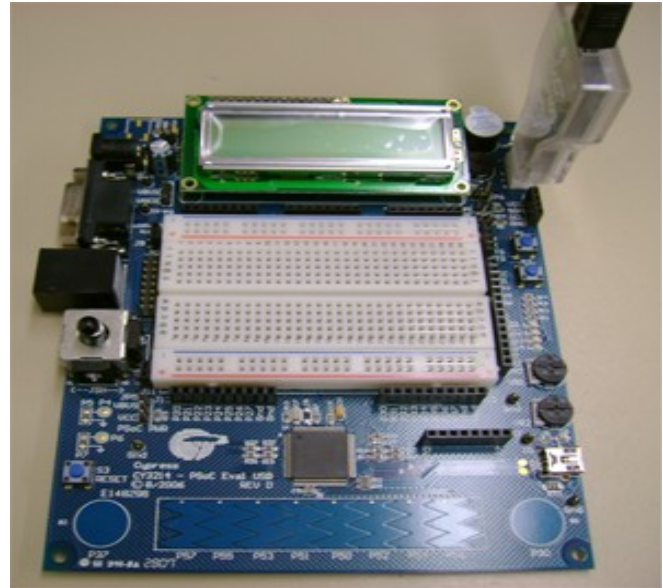


For this Project select CY8C24894, 56-Pin MLF and check off Assign pins automatically. Click OK. The Program will begin to build and once it finishes it will display any errors. Once building is complete you will be presented with a schematic of the chip and the assigned pins.

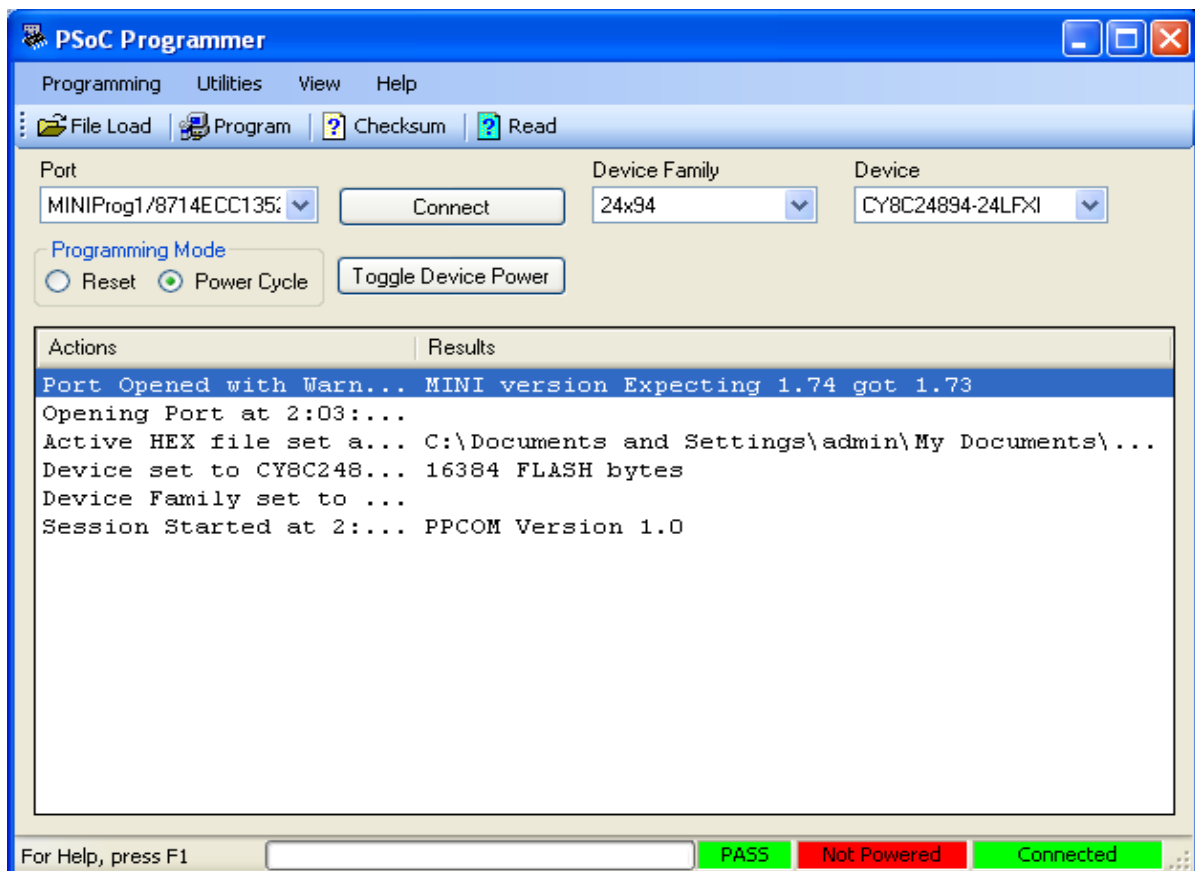
Programming

Now that the program has been built and the pins assigned it is now time to program the microcontroller. To do this go to the menu bar and select Program > PSoC Programmer, this will open the program used program the microcontroller.

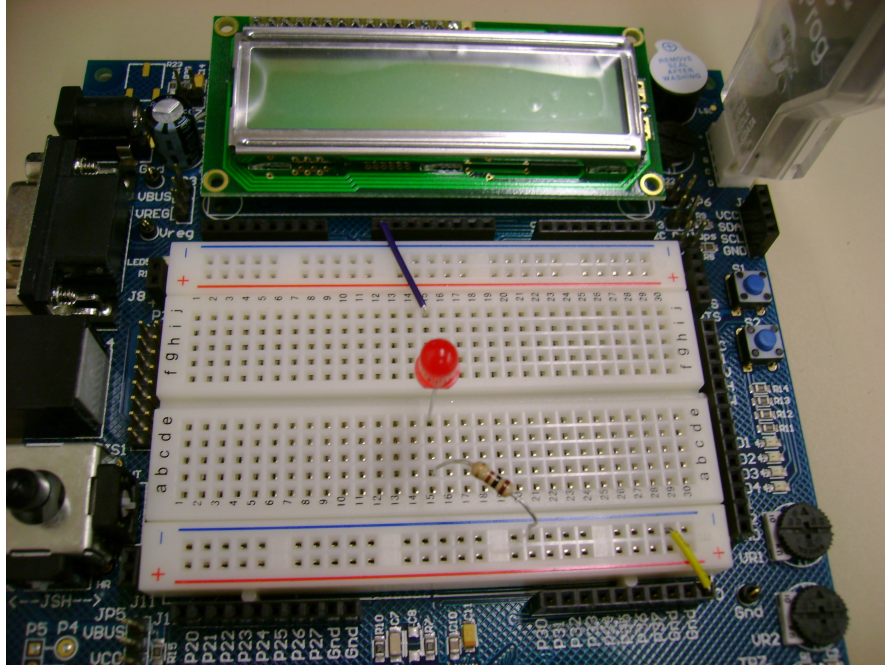
At this time connect your MiniProg to the microcontroller. The MiniProg is used to program and power the board in this example through the USB port.



Select 24x94 from the Device Family menu and select CY8C24894-24LFXI from the Device menu. Now click the Program button from the menu to program the microcontroller. Do not hook up any circuits to the microcontroller prior to programming the microcontroller because the programming will fail.



Once the microcontroller is programmed you can now connect your circuit show below:

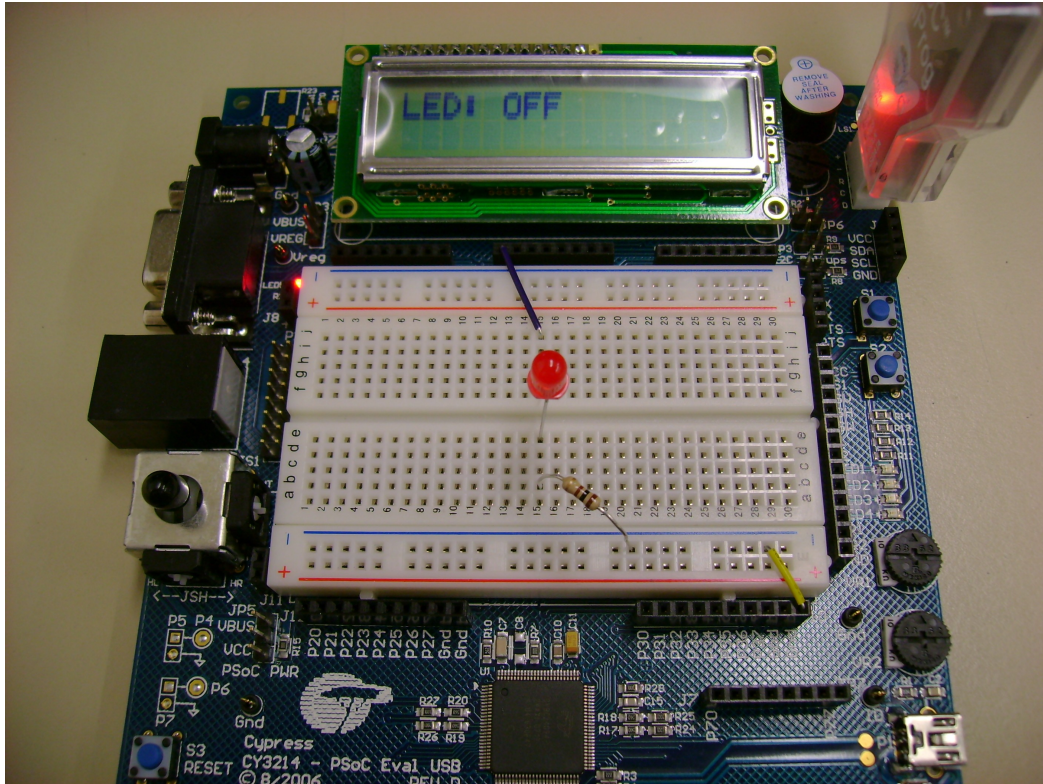


The positive terminal of the LED is connected to pin P1[0] and the negative terminal is connected through a 100 ohm resistor to ground.

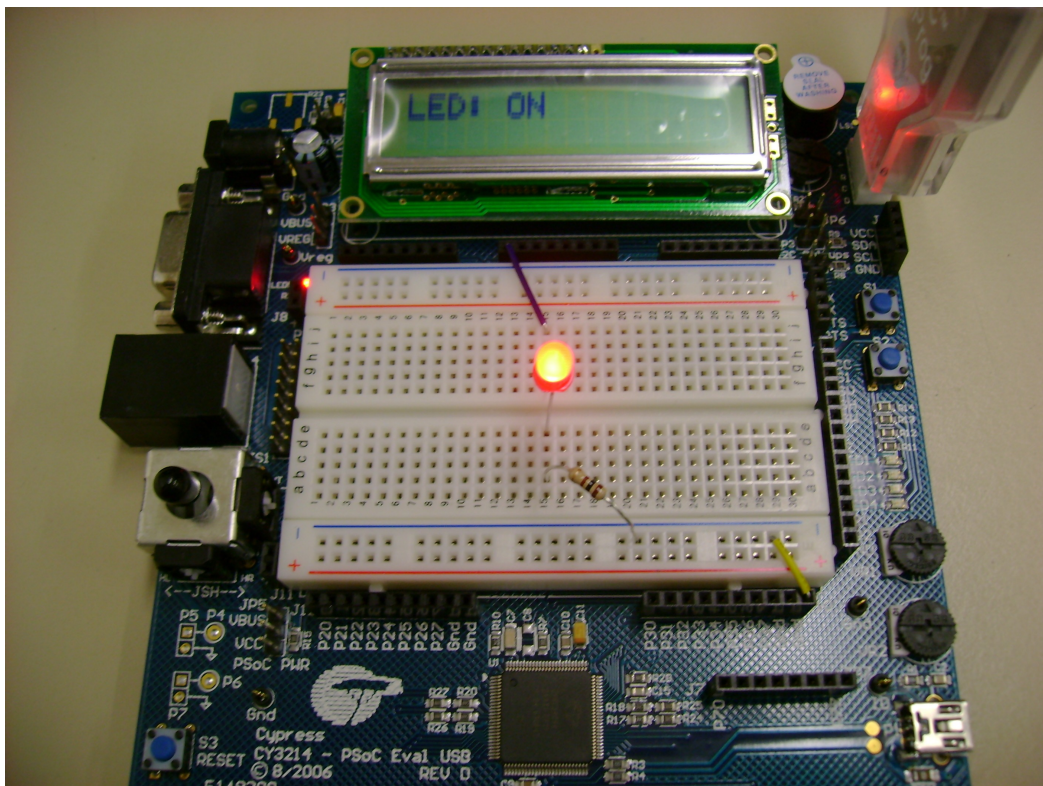
Testing

Now that the circuit is hooked up it is now time to turn on the microcontroller. To do this click the Toggle Device Power button in the PSoC Programmer window. The LED should now be toggling on and off every 5 seconds with the LCD displaying its state. Below are pictures on these on and off states.

OFF state:



ON state:



Conclusion

PSoC Designer is a very versatile tool in designing programs for PSoC microcontrollers. Its system level view of designing with drag and drop capabilities require very little programming experience to develop complex programs.