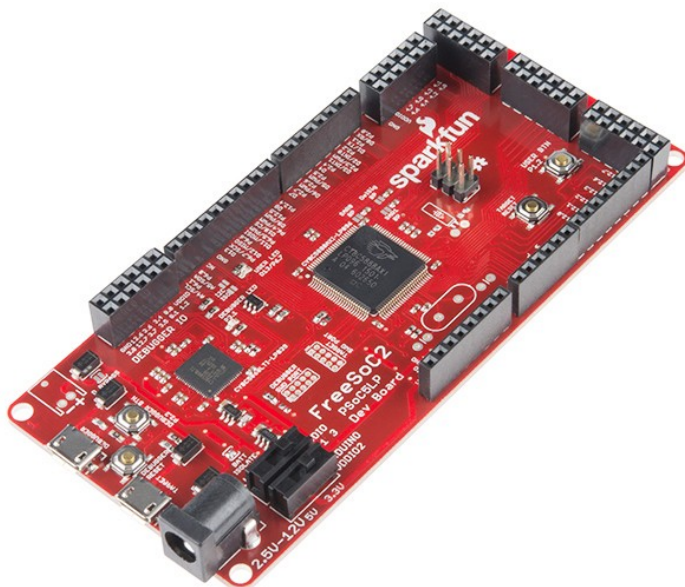




2016

***Serial Communication
(UART)
with
FreeSoc2 (PSoC 5LP)
using PSoC Creator***



Author: Gurudatta Palankar

Version: 1.0

Introduction:

The FreeSoC2 micro-controller based on the PSoC 5LP (Programmable System on a Chip) brings together features of the programmable devices and micro-controller-type systems on chips into one package. By placing a programmable fabric between the peripherals and the pins, the FreeSoC2 allows any function to be routed to any pin! Moreover, the on-board PSoC includes a number of programmable blocks which allow the user to define arbitrary digital and analog circuits for their specific application. To get the most out of the device, you will need to use the PSoC Creator IDE.

Step 1: Open PSOC creator IDE.

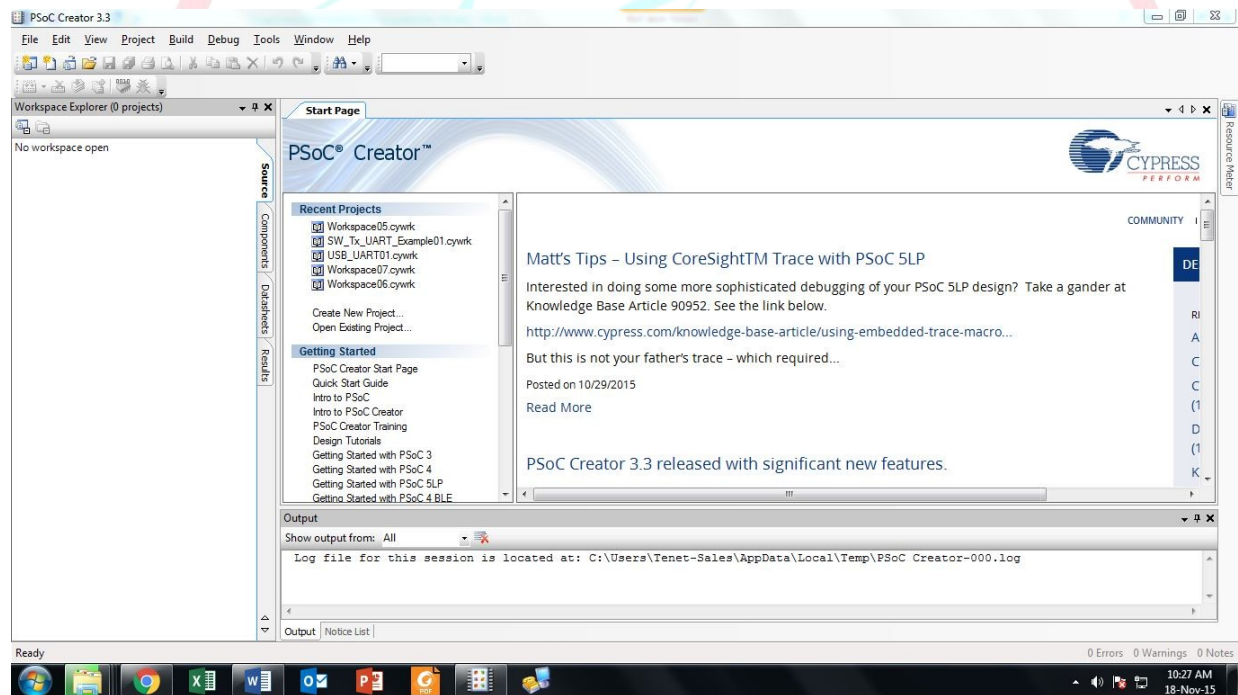


Figure 1

Step 2: File-> new project -> design -> PSoC 5LP design & save with desired name.

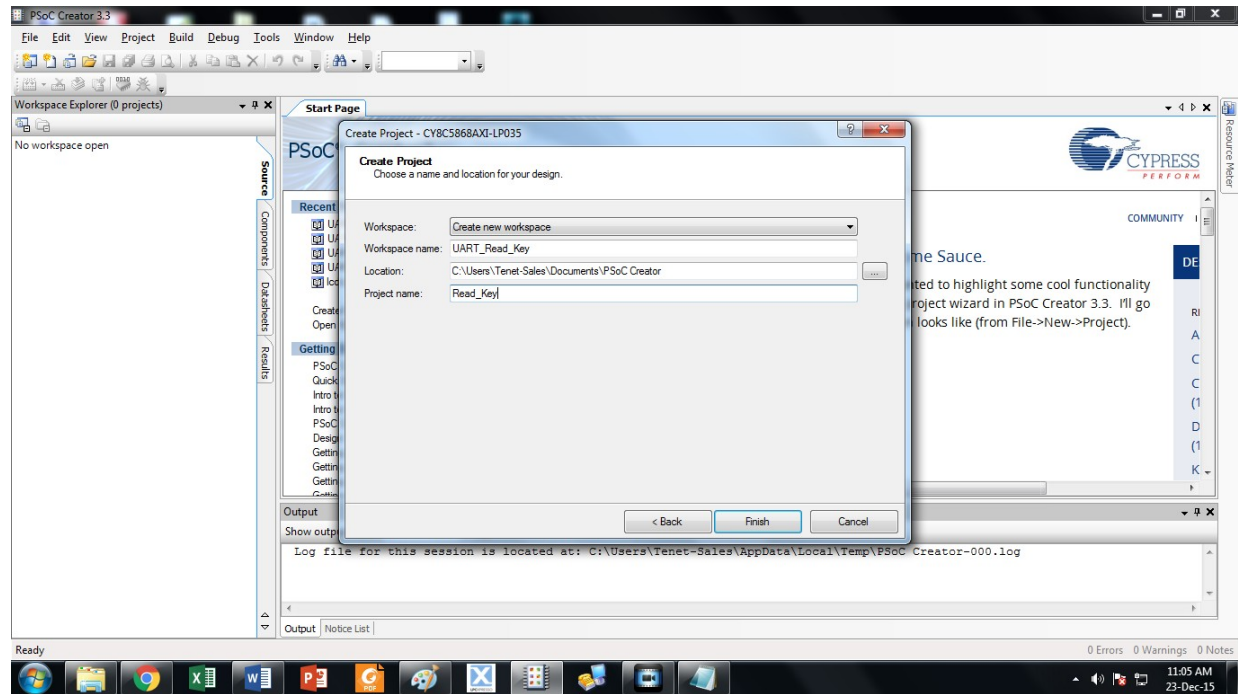


Figure 1

Step 3: Open TopDesign.cysch from workspace explorer.

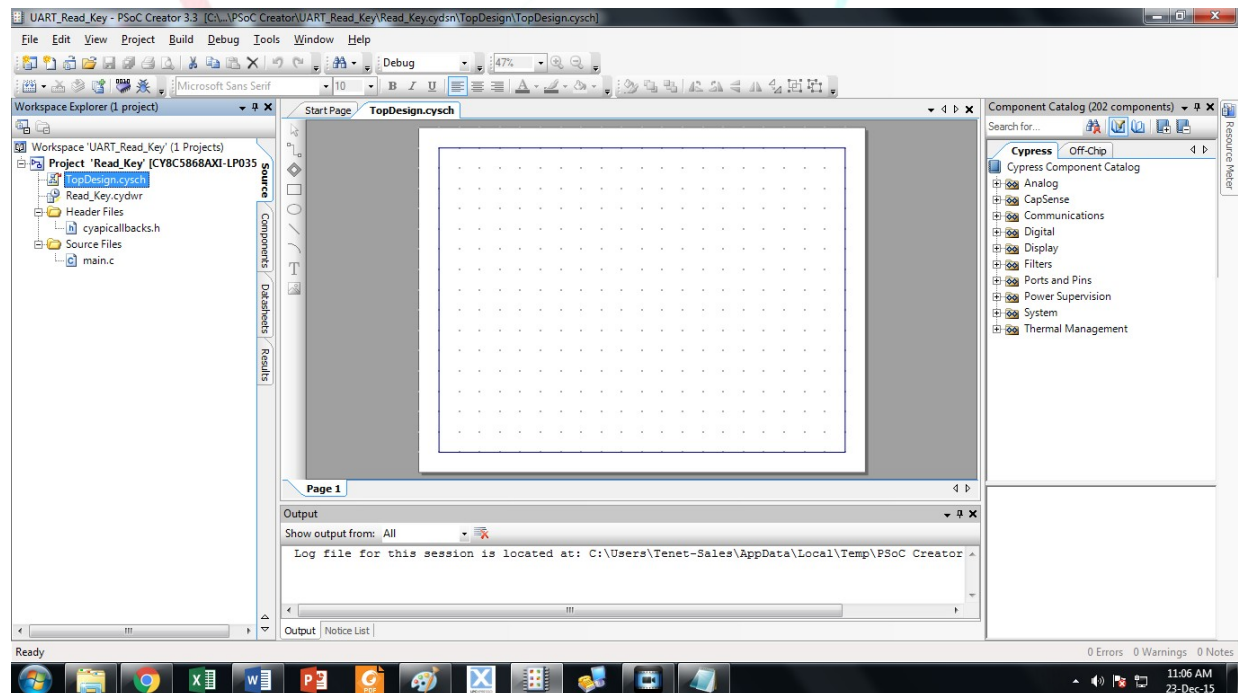


Figure 2

Step 4: To read a character from the keyboard and display it on terminal (screen) there is a need of serial communication. Search for UART block from the Component catalog on right side of the window. Drag the UART block onto the workspace.

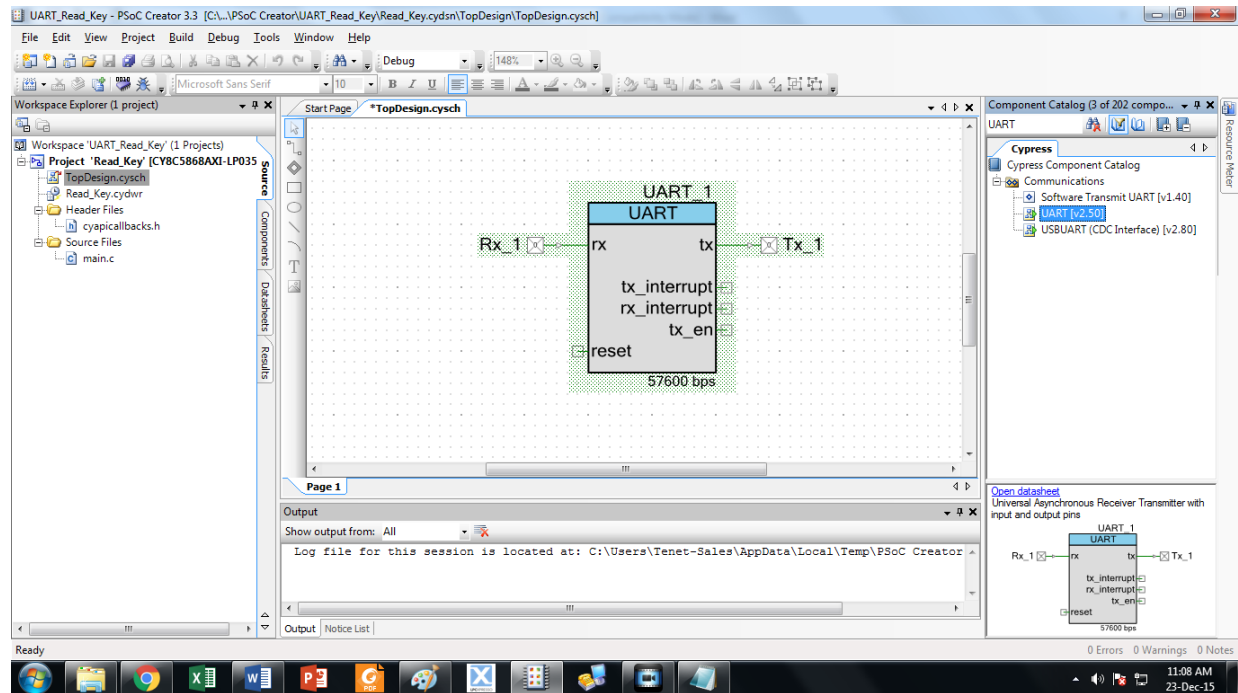


Figure 3

Step 5: Double click on the UART block and change the name if you wish to. Configure the UART as 8-bit and baud rate of 9600 bps.

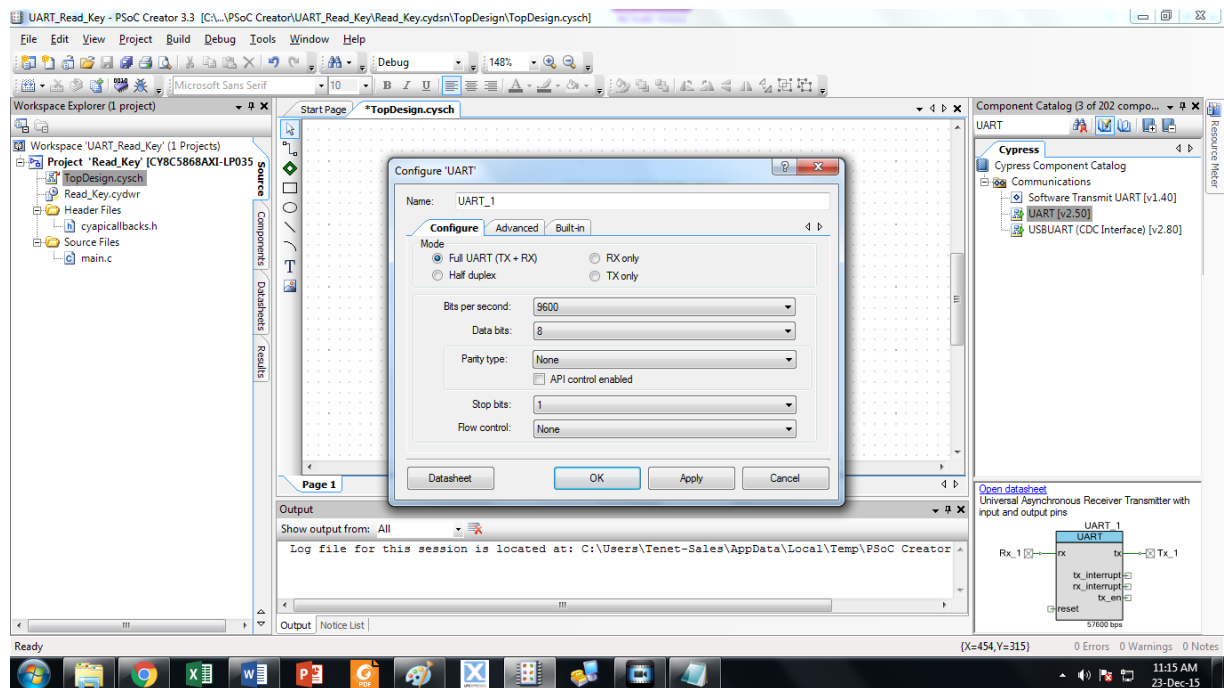
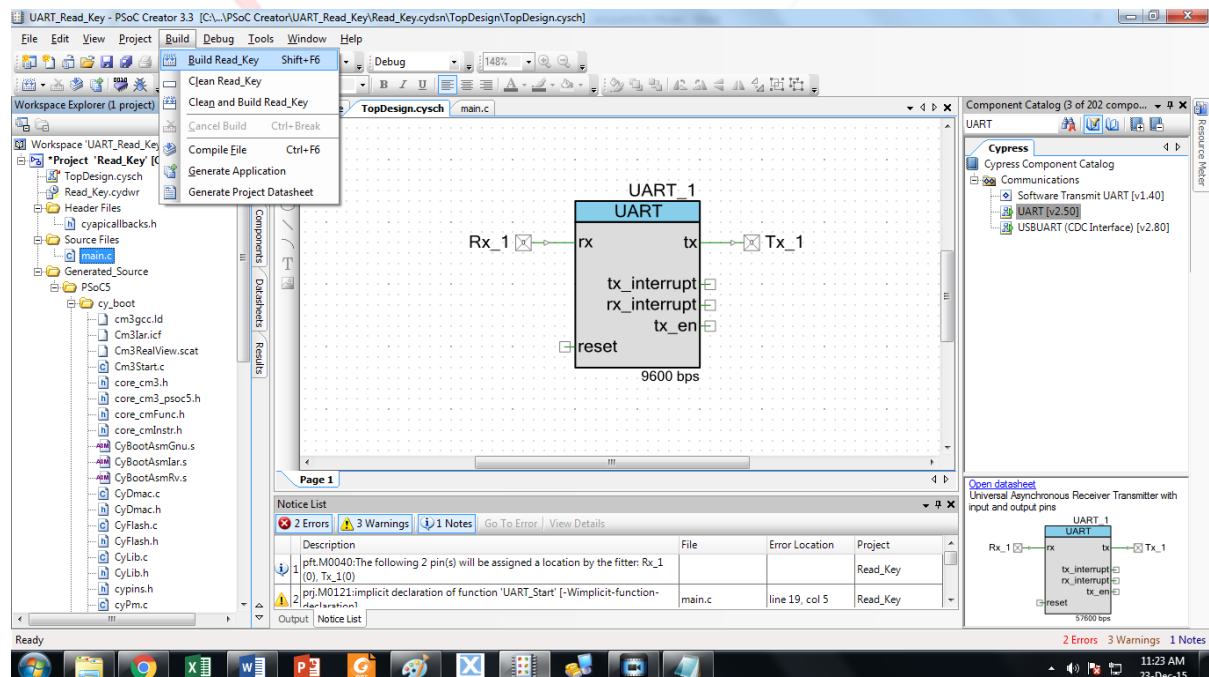


Figure 5

Step 6: After configuring build the project. As we can generate user-defined APIs which will ease us while writing code. We can see APIs generated in the Workspace Explorer on the left side of the window.



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Figure 6

Step 7: Click on main.c from Workspace Explorer. Write the code

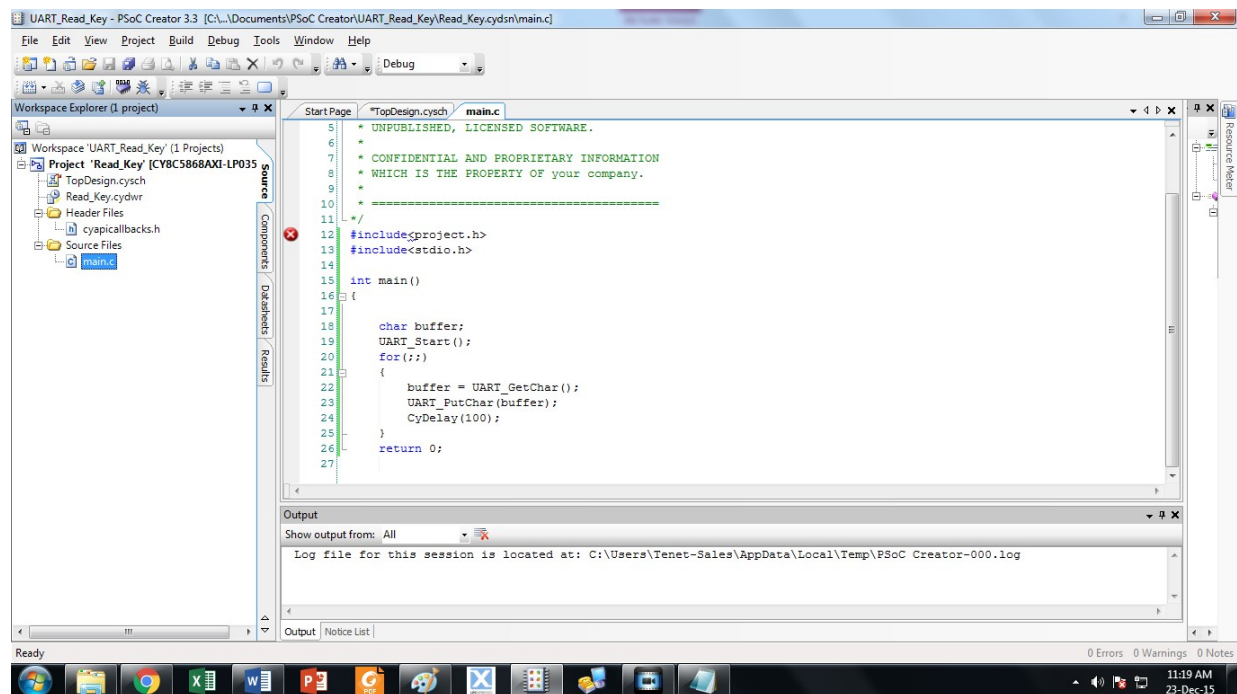


Figure 7

CODE:

```
#include<project.h>
#include<stdio.h>
```

```
int main()
{
    char buffer;
    UART_1_Start();
    for(;;)
    {
        buffer = UART_1_GetChar();
        UART_1_PutChar(buffer);
        CyDelay(100);
    }
    return 0;
}
```

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Step 8: Click on Read_Key.cydwr from Workspace Explorer.

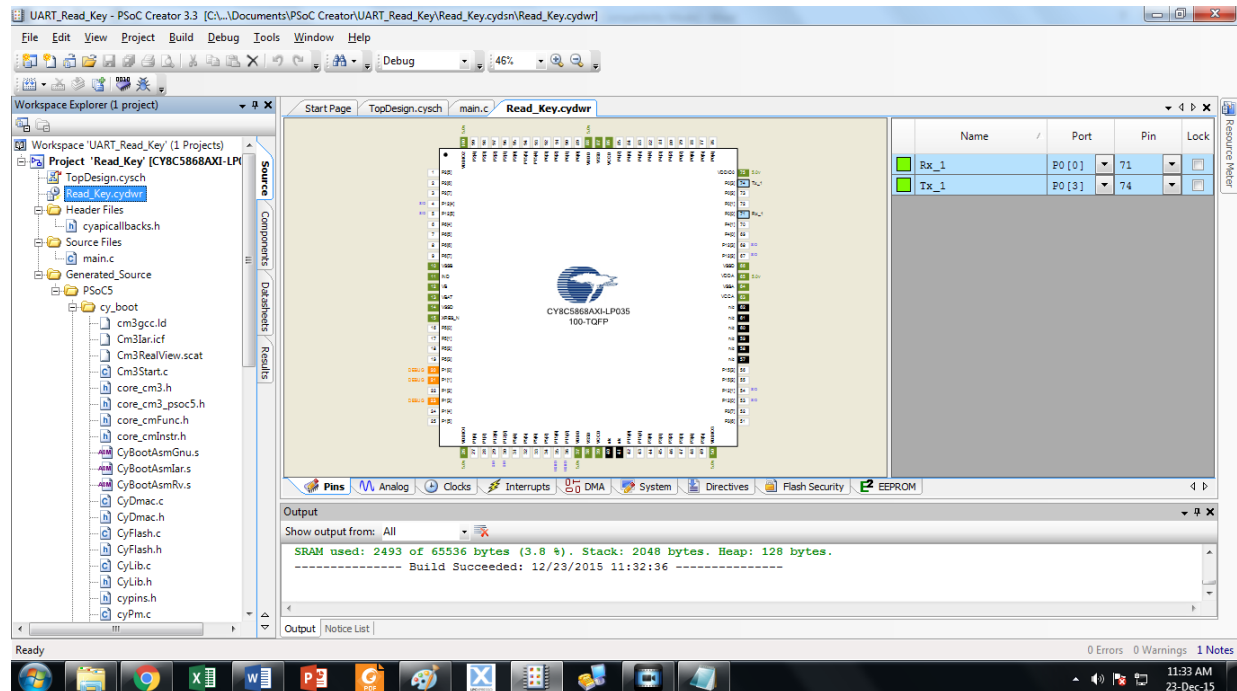


Figure 8

Step 9: Finally, assign pins to desired ports. Pin P2.0 is RX and P2.1 is TX for target IC. Then we connect the two pins to RX/TX pins on the debugger/programmer which is 12.6 (RX) and 12.7 (TX). Note that the RX pin from the PSoC 5LP MCU should be connected to the TX pin of the debugger. And the P2.1 TX pin should be connected to the debugger's RX pin (12.6).

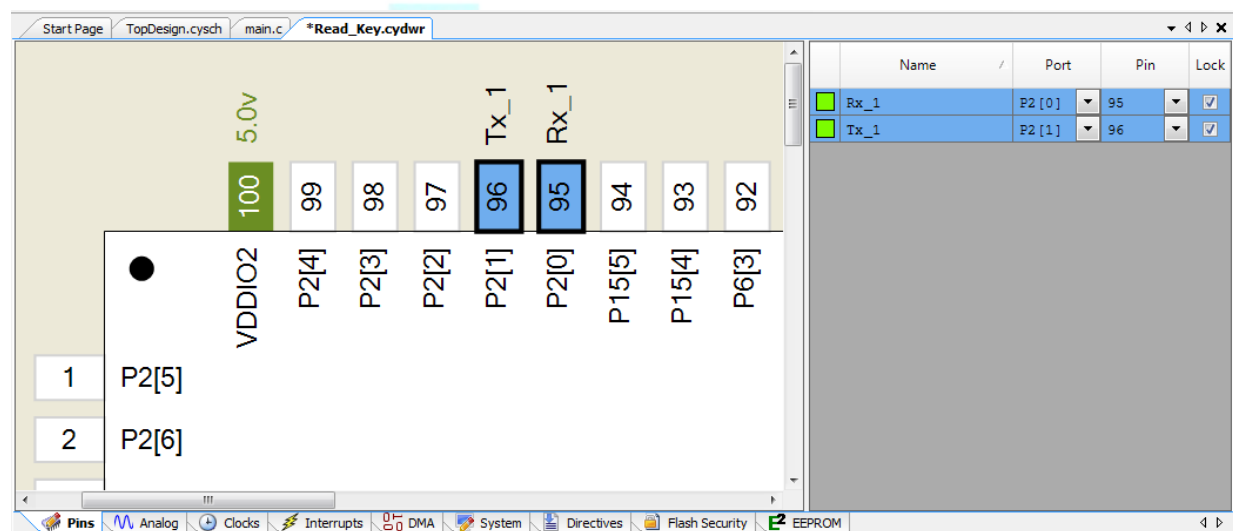


Figure 9

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Step 10: Click on Build on menu bar and build the project, check for errors.

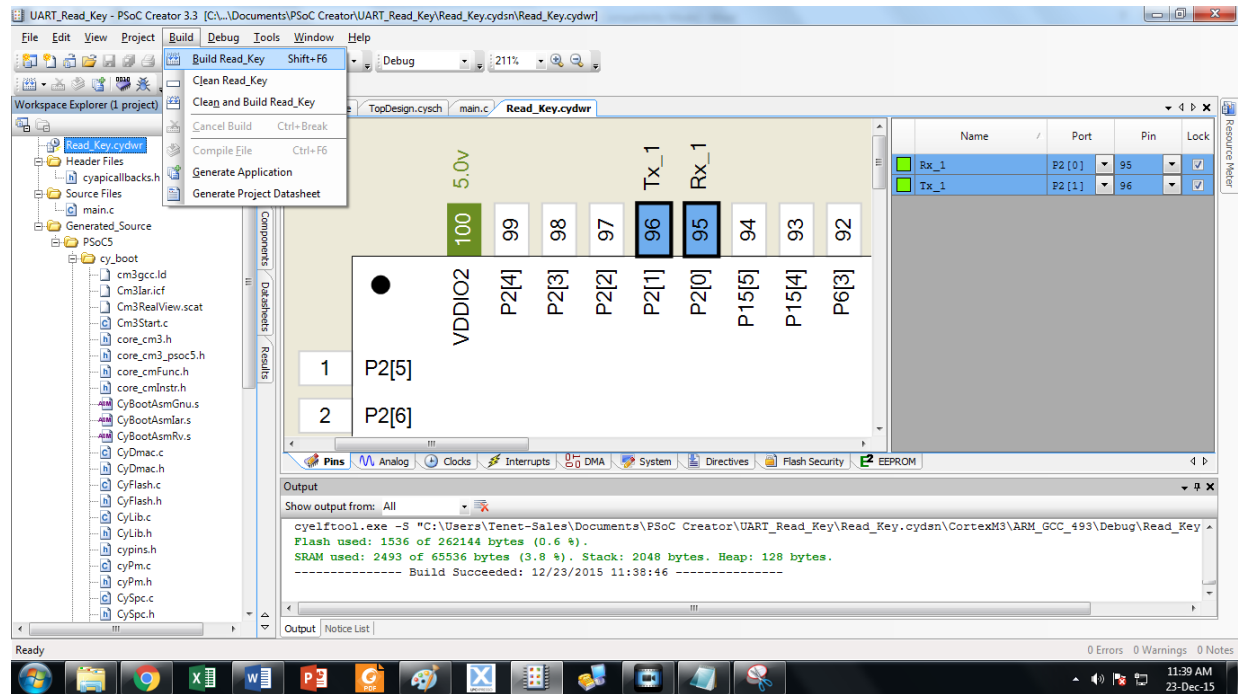


Figure 10

Step 11: If everything goes well connect Micro B cable to debugger port of Freesoc2. To upload the file to Freesoc2 click on Debug --> Program.

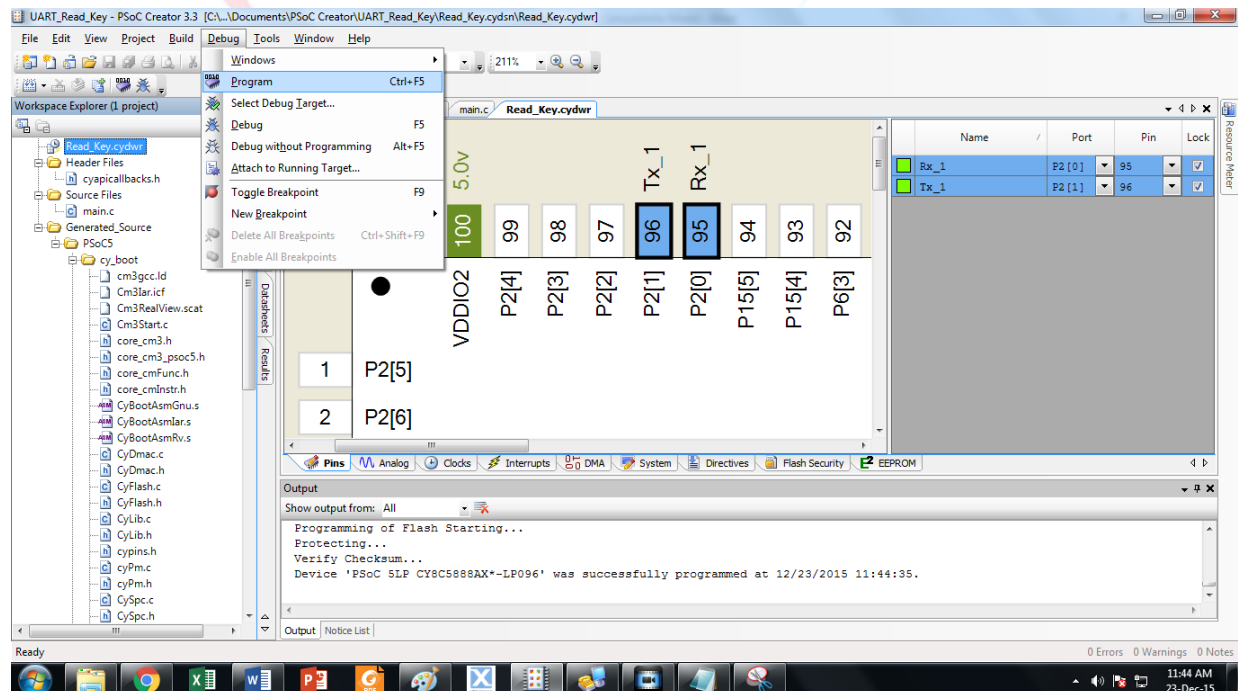


Figure 11

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Step 12: Now to read the characters from keyboard and displaying onto screen we need a terminal. A terminal used to display via COM ports. You can use any terminal such as Putty, Hyper-Terminal, X-CTU and so on. Here we have used Hyper-Terminal. Select appropriate COM port.

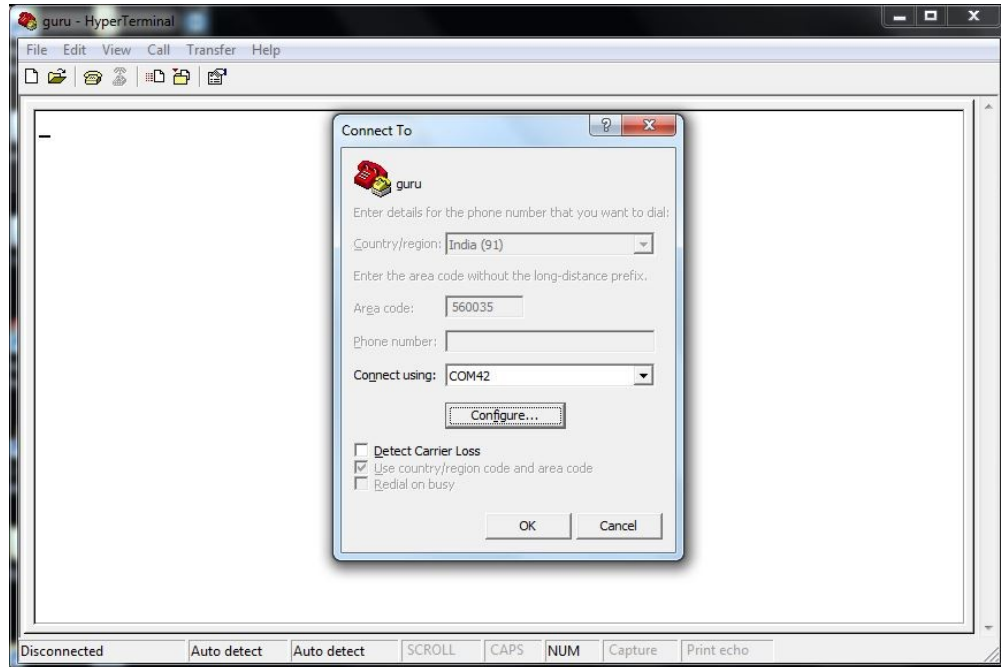


Figure 12

Step 13: Configure as 8-bit and baud rate of 9600 bps.

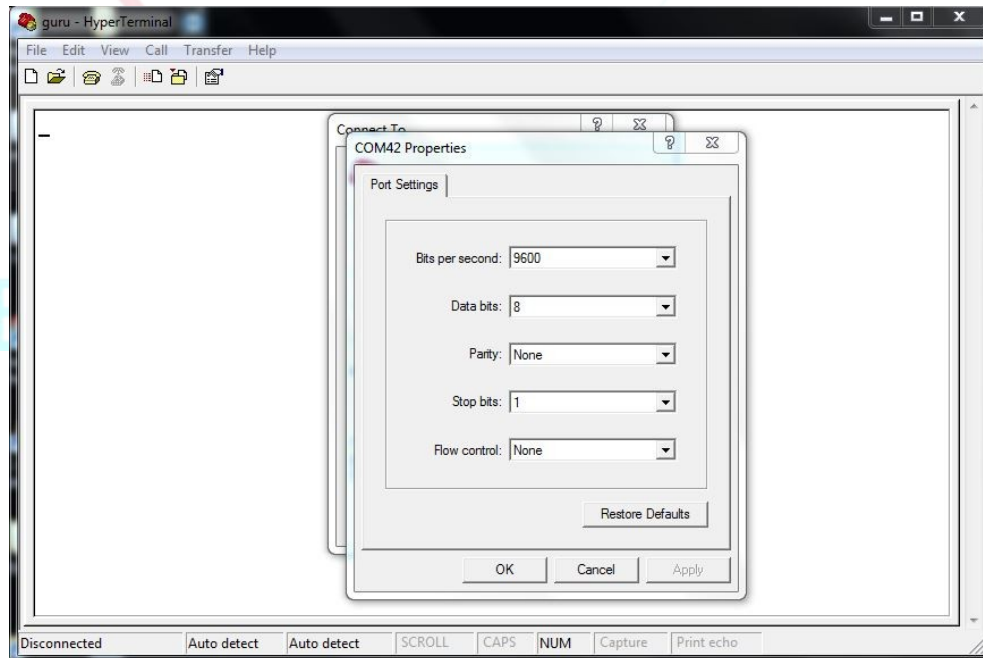


Figure 13

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Step 14: Use keyboard to write message.

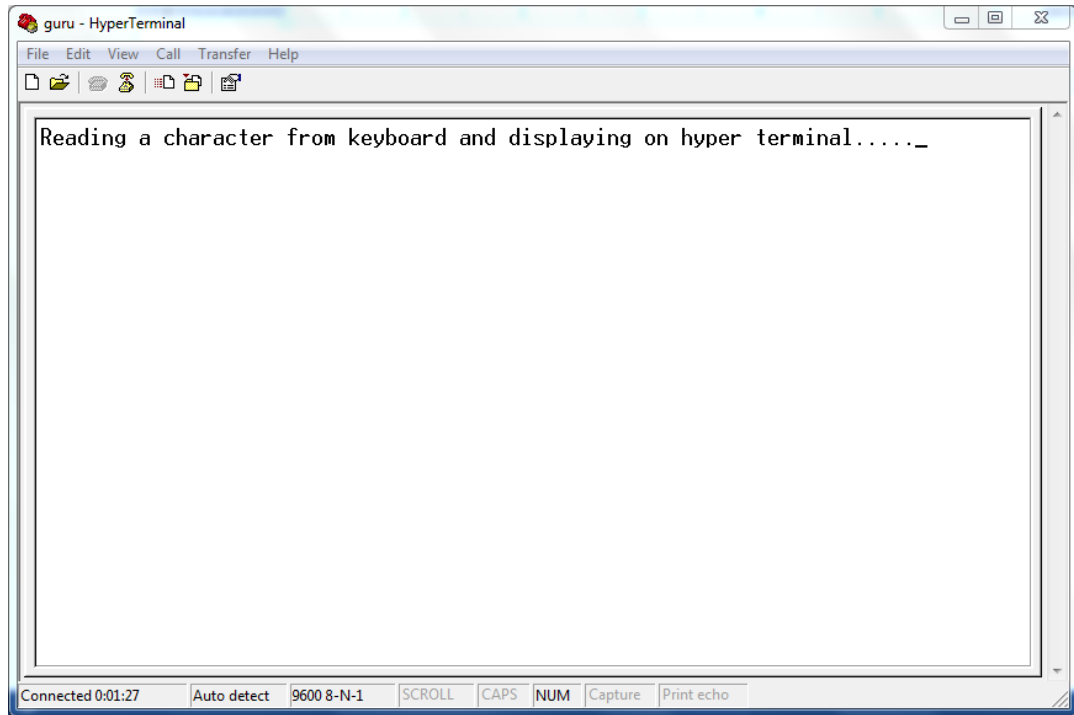


Figure 14

EXPLANATION:

The UART module we just added is typically used to achieve a serial communication link using some of the GPIO pins. In this case we want to be able to transfer our data through the USB interface to our PC to avoid the need of any additional cables and equipment.

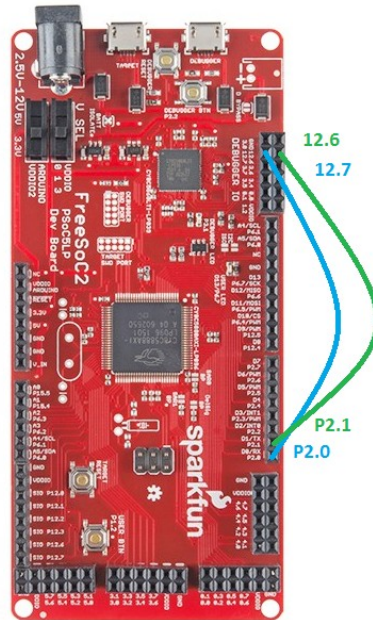


Figure 15

Pin P2.0 is RX and P2.1 is TX. We connect the two pins to RX/TX pins on the debugger/programmer which is 12.6 (RX) and 12.7 (TX). Note that the RX pin from the PSoC 5LP MCU should be connected to the TX pin of the debugger. And the P2.1 TX pin should be connected to the debugger's RX pin (12.6).

OUTPUT:

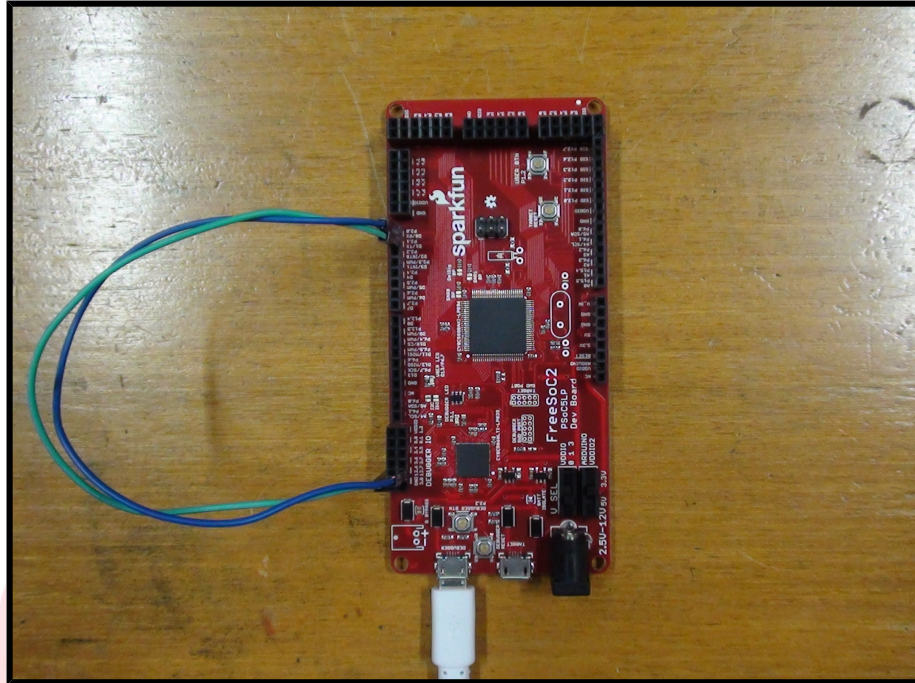


Figure 16

For product link:

1. <http://www.tenettech.com/product/7241/freesoc2-development-board-psoc5lp>

For more information please visit: www.tenettech.com

For technical query please send an e-mail: info@tenettech.com