MINI DEVELOPMENT BOARD

LPC 2129

USERS GUIDE

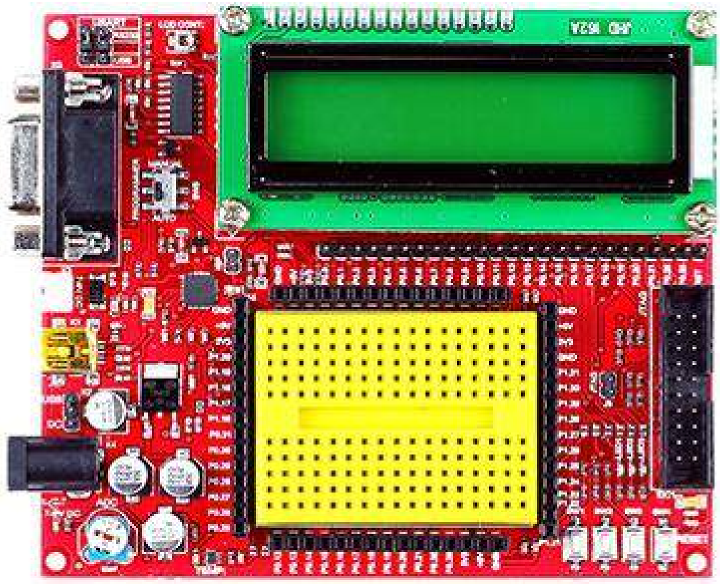
make your own intelligent embedded world . . .

rhydoLABZ™

TABLE OF CONTENTS

OVERVIEW

ARM LPC2129 Mini Development Board is a miniature and powerful hardware platform to evaluate LPC2129 Flash memory microcontroller. The eCee ARM LPC2129 Board contains all hardware components that are required in a single-chip LPC2129 controller system ,plus Mini USB or Serial Cable can be used for programming ARM LPC2129 Mini Development Board.



1.1. CONTROLLER SPECIFICATION

1. 16/32-bit ARM7TDMI-S microcontroller in a 64 or 144 pin package.
2. 16 KB on-chip Static RAM
3. 128/256 kB on-chip Flash Program Memory
4. 128-bit wide interface/accelerator enables high speed 60 MHz operation.
5. External 8, 16 or 32-bit bus (144 pin package only)
6. In-System Programming (ISP) and In-Application Programming (IAP) via on-chip boot-loader software.
7. Flash programming takes 1ms per 512 byte line. Single sector or full chip erase takes 400ms.
8. Embedded-ICE-RT interface enables breakpoints and watch points.
9. Interrupt service routines can continue to execute whilst the foreground task is debugged with the on-chip Real Monitor software.
10. Embedded Trace Macrocell enables non-intrusive high speed real-time tracing of instruction execution.
11. 2/4 interconnected CAN interfaces with advanced acceptance filters.
12. 4/8 channel10-bit A/D converter with conversion time as low as 2.44 ms.
13. Two 32-bit timers (with 4 capture and 4 compare channels)
14. PWM unit (6 outputs), Real Time Clock and Watchdog.
15. Multiple serial interfaces including two UARTs (16C550), Fast I2C (400 kbits/s) and two SPIs™.
16. 60 MHz maximum CPU clock available from programmable on-chip PLL.
17. Vectored Interrupt Controller with configurable priorities and vector addresses.
18. Up to forty-six (64 pin) and hundred-twelve (144 pin package) 5V tolerant general purpose I/O pins.
19. Up to 12 independent external interrupt pins available (EIN and CAP functions).
20. On-chip crystal oscillator with an operating range of 1 MHz to 30 MHz.
21. Two low power modes, Idle and Power-down.
22. Processor wake-up from Power-down mode via external interrupt.
23. Individual enable/disable of peripheral functions for power optimization.
24. Dual power supply.
    - CPU operating voltage range of 1.65V to 1.95V (1.8V +/- 8.3%).
    - I/O power supply range of 3.0V to 3.6V (3.3V +/- 10%

1.2. KEY FEATURES OF ARM LPC2129 DEVELOPMENT BOARD-MINI

1. Compact and ready to use design
2. On Board 10 MHz Crystal Oscillator
3. Integrated ARM LPC2129 Microcontroller
4. Professional EMI/RFI Complaint PCB Layout Design for Noise Reduction
5. High Quality Two layer PTH PCB
6. Multiple programming options – USB/RS-232 with jumper selection at UART0
7. No separate programmer required (Built in Boot loader)
8. Power indication LED (Red)
9. Multiple Power source (USB, RMC Connector, DC barrel jack) with jumper selection
10. Power Supply with Reverse Polarity Protection
11. Controller Area Network (CAN) transceiver
12. CAN Controller (MCP 2551) interface
13. CAN connection taken from RMC connector (+5V, CANH, CANL, GND)
14. Jumper selection at CAN RX & CAN TX
15. Buzzer interface
16. Pot interface to ADC
17. Temperature Sensor (MCP 9700) interface
18. For Buzzer,Temperature Sensor and Potentiometer jumper selection available, if necessary interface independently
19. Servo motor(SIG,+5V,GND), LCD & ZigBee can be easily interfaced through on-board connectors
20. Potentiometer for contrast control
21. ZigBee can be interfaced from either side of the board at UART0
22. 4 on-board switches including a RESET switch
23. 3 on-board SMD LED s connected to port pins
24. SMD LEDs and Switches , if necessary interface independently
25. Breadboard can be attached to the board
26. 5V and 3.3V regulators available
27. 3.3V/5V output available in berg strips
28. External power supply and adapter having range of 7 – 9V DC
29. In UART0 communication, position of programmer switch should be in manual mode
30. UART0 available at RMC connector with jumper selection option for power i.e; 3.3V/5V
31. UART1 available on berg strip (GND,TXD1,RXD1)
32. Two on board programming modes
    - Automatic - no reset, no ISP jumper
    - Manual- insert ISP jumper & press reset switch
33. ISP jumper should be removed for code execution
34. On Board JTAG Connector for Debugging/Programming
35. All port pins available at Berg Strip

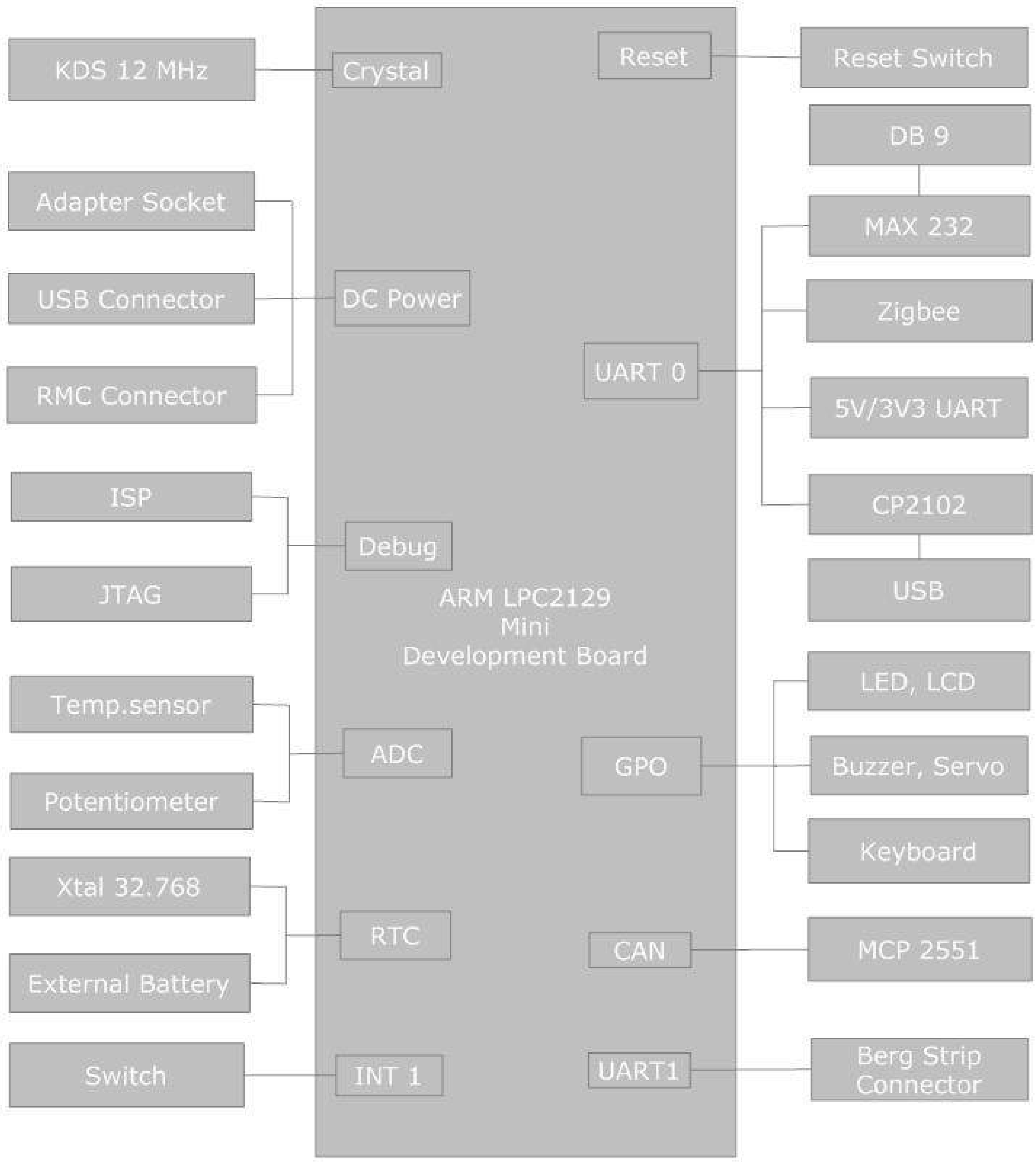
PACKAGE CONTENTS

- Fully Assembled and Tested eCee ARM LPC2129 Mini Development Board
- Software CDROM with
  - Schematic
  - Programming Software
  - Sample Hex Code
  - Example Codes

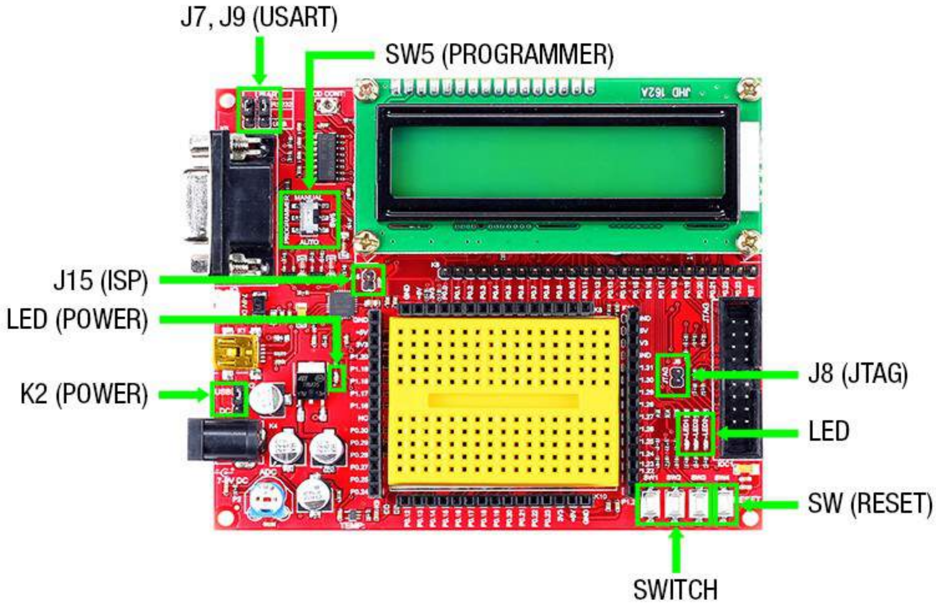
HARDWARE INTRODUCTION

The ARM LPC2129 Development Board (Mini) V1.01 is compatible with the LPC212X series of microcontrollers. On board LPC2129 controller is available. The LPC212X series remains very popular as general purpose microcontrollers, due to their industry standard instruction set, and low unit cost.

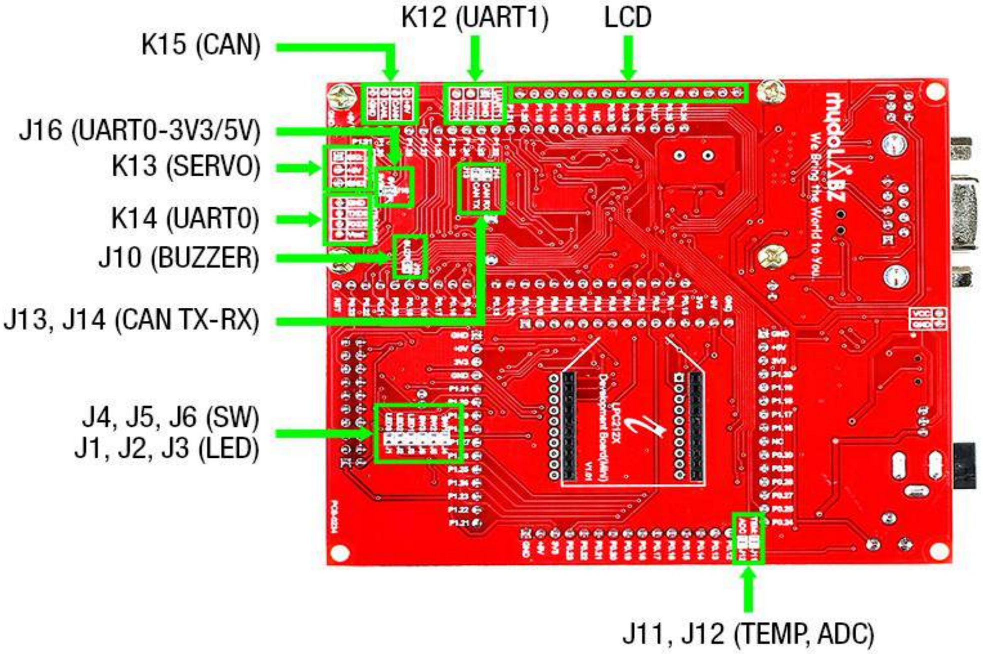
2.1. BLOCK DIAGRAM



2.2. INTERFACE OVERVIEW



Top view of the Development board -Mini



Bottom view of the Development board -Mini

2.3. PERIPHERALS DESCRIPTION

PERIPHERALS	DESCRIPTION
ISP(J15)	ISP Connector,To program the IC
K6,K7	PORT pins on male berg strip
K1	USB Socket
K2	To select power source as USB/DC
K3	2 pin RMC connector for power
K4	DC barrel jack
K5	UART Interface via Female DB9 Connector
K14	RMC connector for 3V3/5V UART
K13	Servo connector pin
K8-K9-K10-K11	PORT pins on female berg strip
LED1-LED3	Light Emitting Diodes
PWR	Power indication LED
SW1-SW3	Pull-Up Switches
RESET(SW4)	Reset Button
PROGRAMMER(SW5)	To select Auto/ Manual mode of programming
LCD CONT (P1)	LCD Contrast control Pot
ADC (P2)	Potentiometer used as ADC input
U1	ARM LPC 2129
U2	LM7805(5V regulator IC)
U3	LD1117 (3V3 regulator IC)
U4	CP2102(USB interface)
U5	MAX232(Level converter)
U6	Temperature Sensor (MCP9700)
U7	Zigbee module connectors
U8	CP 2985(1.8V regulator)
U9	MCP 2551
IDC1	JTAG connector
BUZ1	Buzzer
LCD1	LCD

2.4. JUMPER SET DESCRIPTION

JUMPER No.	DESCRIPTIONS	SET OPTIONS	SETTINGS DESCRIPTION
K2	Power Supply Options	1-2	Select USB power
		2-3	Select external DC power
J16	UART0	Short to access	Select 3.3/5 V level for UART communication via RMC connector
J12	Potentiometer	Short access	Enables ADC connection via POT
J11	Temperature Sensor	Short access	Enables temp sensor connection
J1, J2, J3	LED	Short access	Enables LED connection
J4,J5,J6	Pull-Up Key	Short access	Enables Pull-Up Key connection
J10	Buzzer	Short access	Enables buzzer connection
J8	JTAG	Short access	Establish J connection
J14,J1	CAN TX,RX	Short to access	MCP 2551 (CAN controller)
J7, J9	USART	1-2	RS232 Connection
		2-3	USB Connection

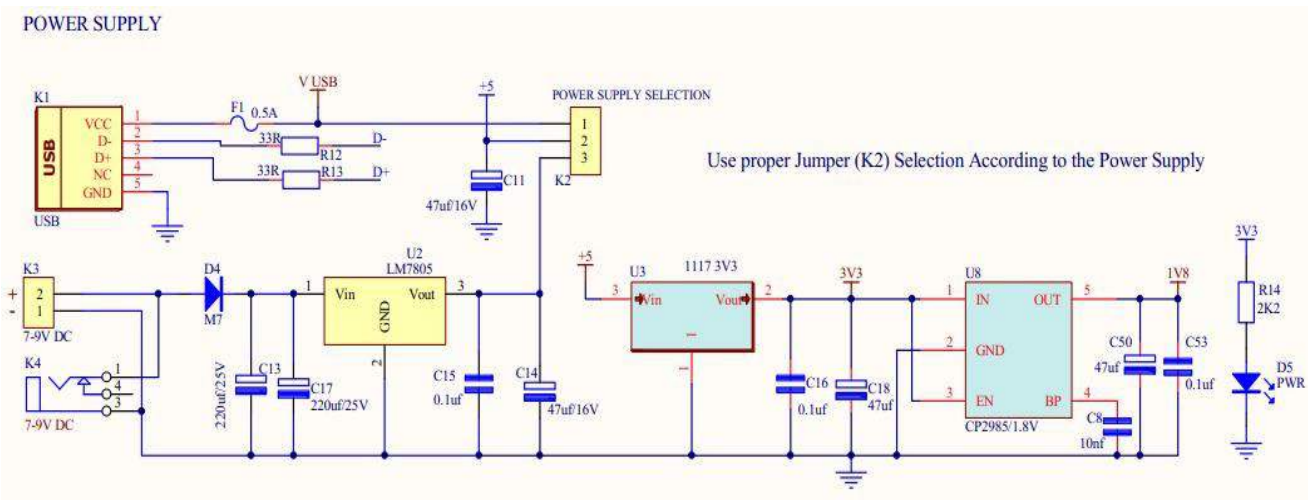
2.5. POWER SUPPLY

ARM LPC2129 Mini Development Board has 3 provisions for giving power supply input

- USB connector
- DC Barrel Jack Connector
- 2 Pin Male RMC Connector

The input source can be selected as DC/USB using the jumper. If DC source is selected, then either DC Barrel Jack or RMC connector can be used and the supply voltage should be in the range of 7-12 V. Once the board is powered, the power LED(red LED on the board) glows.

The external Power Supply circuit is given below:

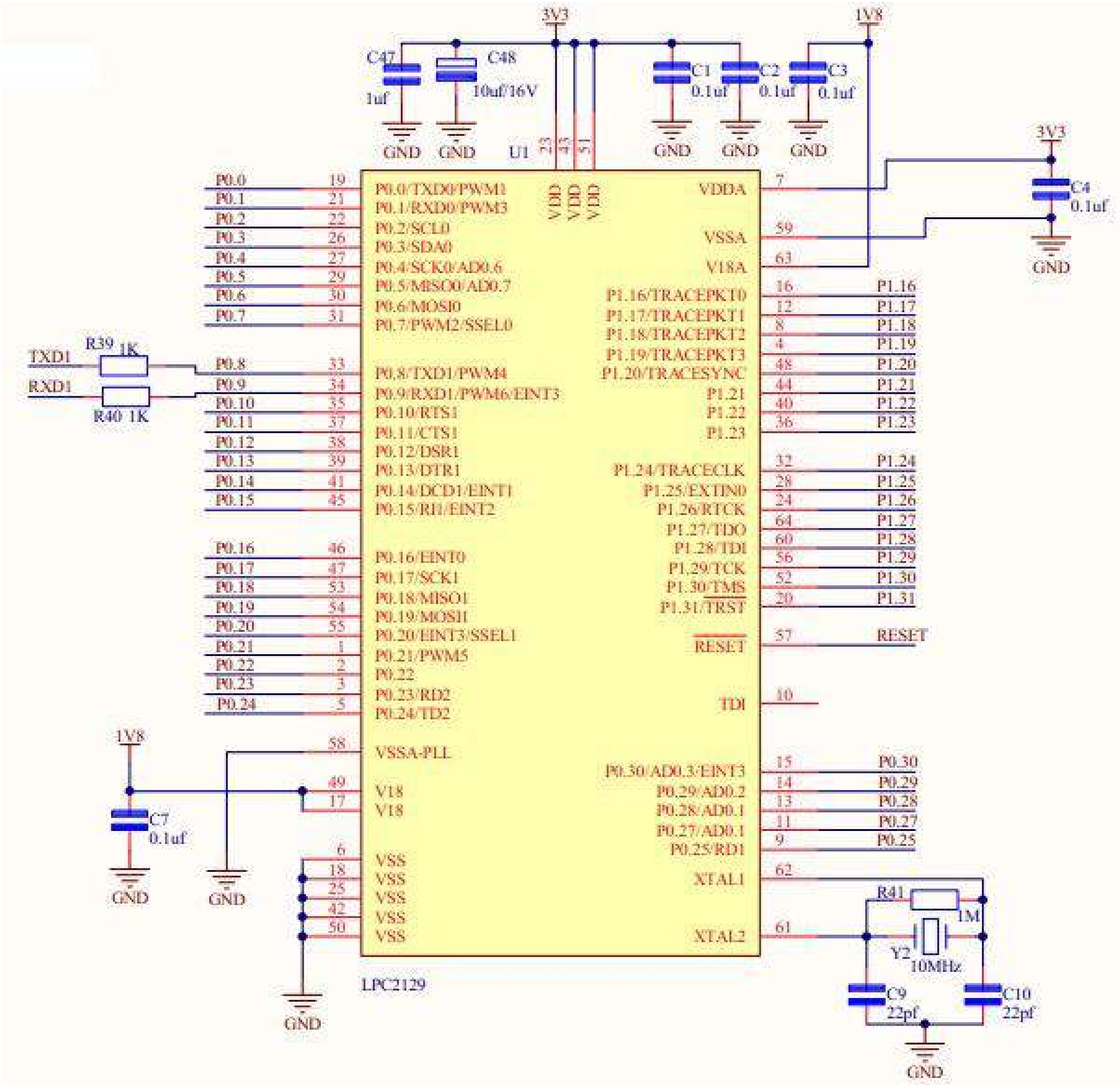


2.6. CLOCK SOURCE

LPC2129 Mini Development Board uses

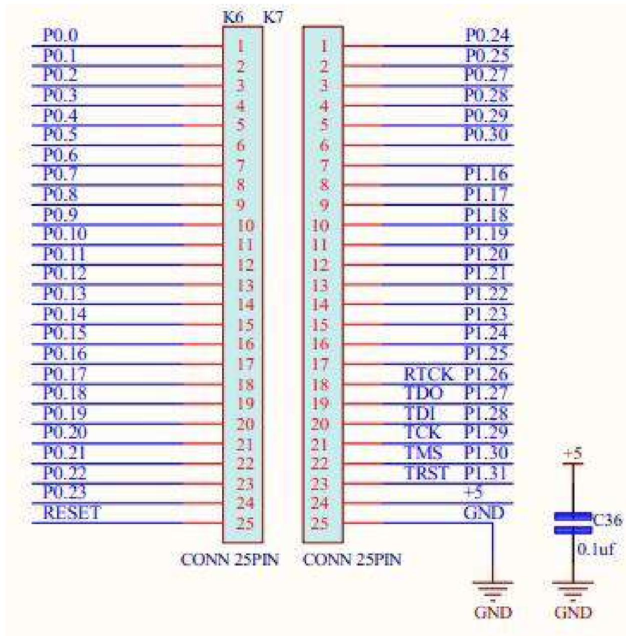
- 10 MHz crystal as the MCU clock source

2.7. MICROCONTROLLER - PIN OUT

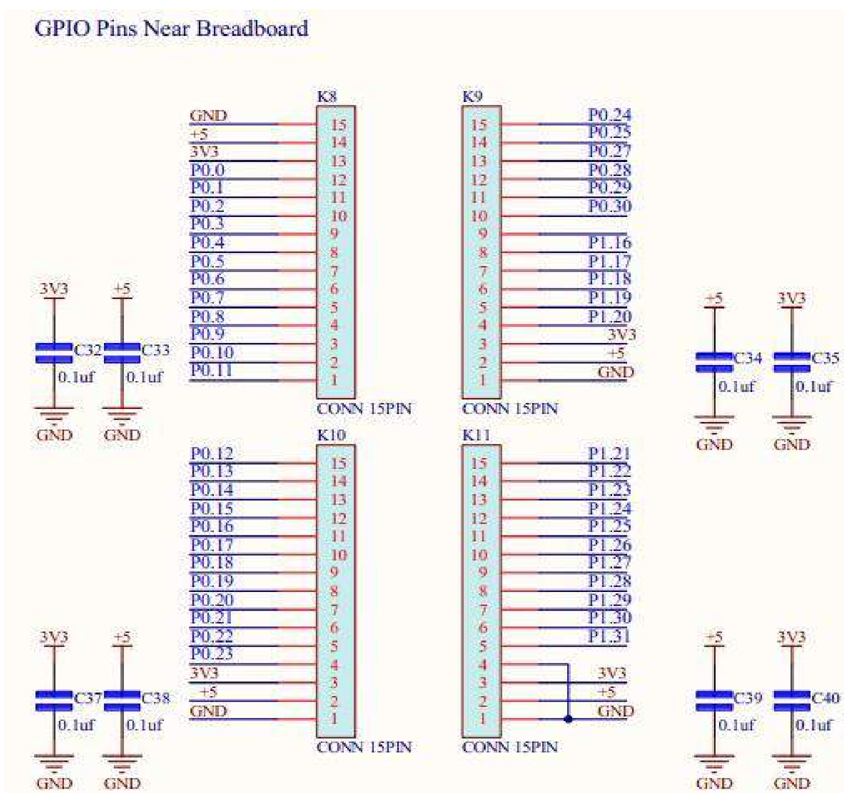


2.8. PORT EXPANDER (INPUT/ OUTPUT PORTS)

Near Controller



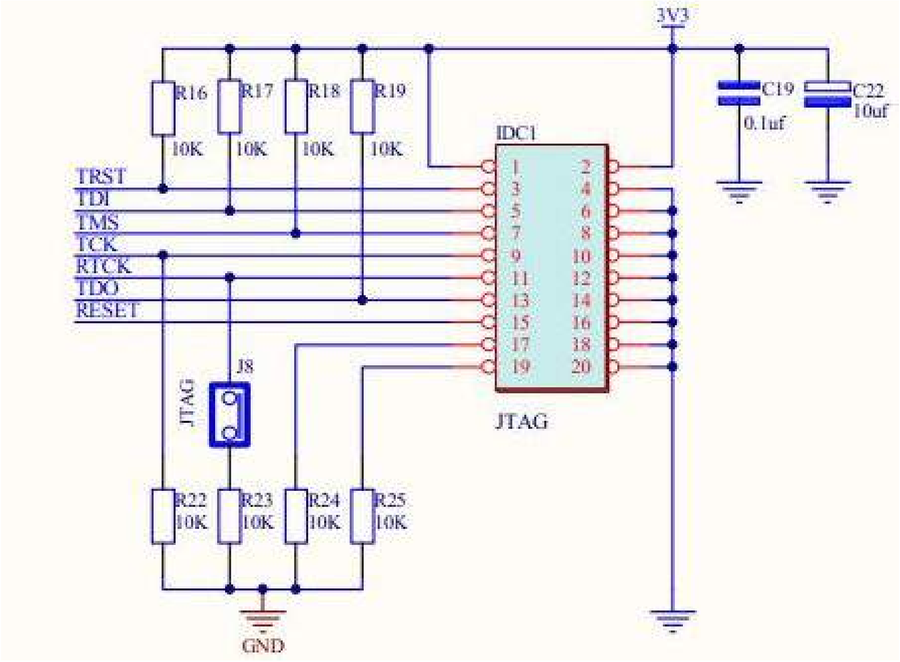
Near Breadboard



2.9. JTAG CONNECTION

The Joint Test Action Group (JTAG), is an integrated method for testing interconnects on printed circuit boards (PCBs) that are implemented at the integrated circuit (IC) level.

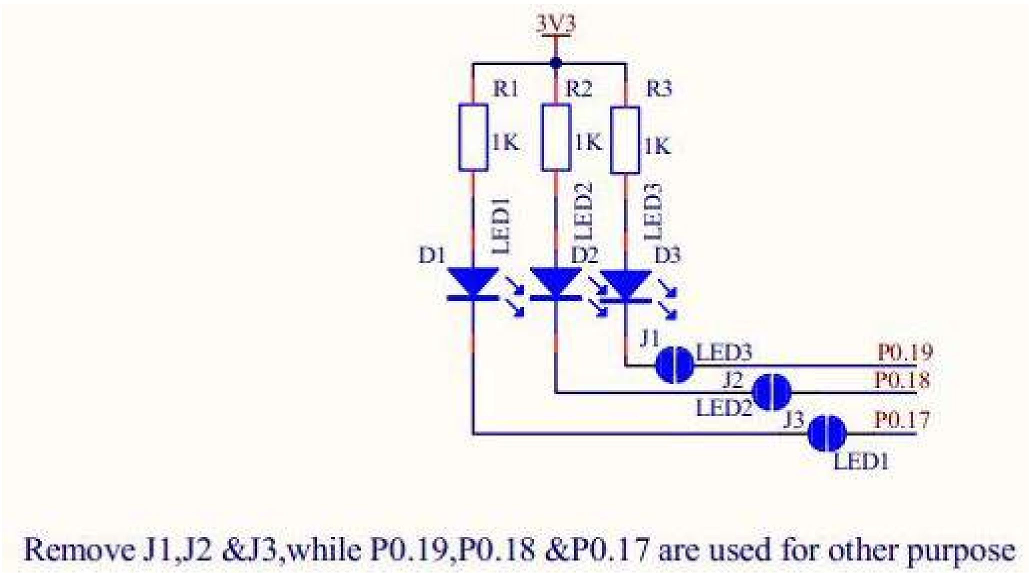
The microcontroller can also be programmed and be used to test the operation of the microcontroller with the JTAG programmer. In order to enable the JTAG programmer to be used, it is necessary to place jumper J8 in the position



2.10. LED INTERFACING

LED's are semiconductor diodes, electronic devices that permit current to flow in only one direction. The diode is formed by bringing two slightly different materials together to form a PN junction. In a PN junction, the P side contains excess positive charge ("holes") while the N side contains excess negative charge ("electrons"). When a forward voltage is applied to the semi conducting element forming the PN junction, electrons move from N area toward P area and holes move from P area toward N area. Near the junction, the electrons and holes combine. As this occurs, energy is released in the form of light that is emitted by the LED. The material used in the semi conducting element of an LED determines its color. LED's are the simplest devices to test port functioning.

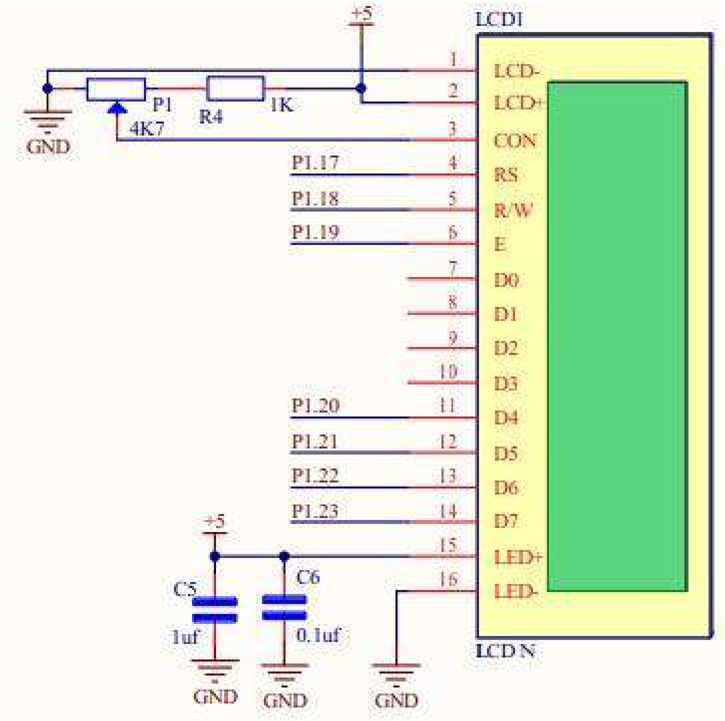
LPC 2129 mini development board has 3 **SMD LEDs** connected to port pins **P0.17, P0.18** & **P0.19** via jumpers **J1 , J2 & J3**. If any jumper is left open, then the corresponding port pin can be used independently. The LEDs turn **ON** when the port pins are at **logic high state** and they get turned **OFF** when the port pins are **at logic low state**. Each LED is interfaced via a current limiting resistor.



Note: *Remove J1,J2 & J3 when P0.19,P0.18 & P0.17 are used for other purpose.*

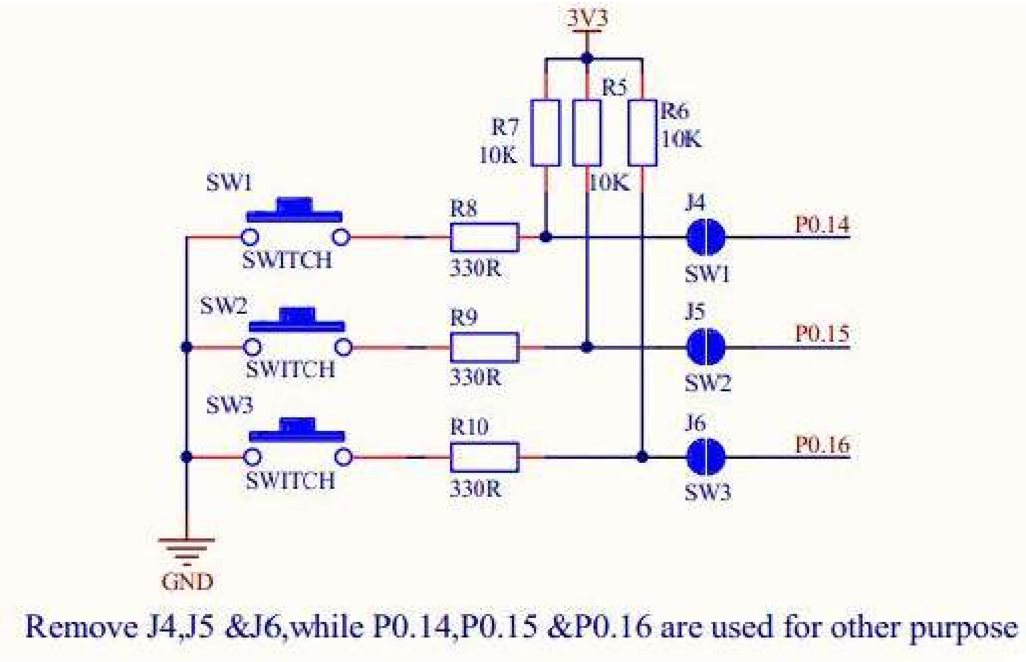
2.11. LCD - LIQUID CRYSTAL DISPLAY

The display is a standard 16x2 LCD which displays 2 lines of 16 characters. Each character is 40 pixels, making it 1280 pixels overall. The display receives ASCII codes for each character at the data inputs (D0–D7). The data is presented to the display inputs by the MCU, and latched in by triggering the E (Enable) input. The RW (Read/Write) line can be tied low (write mode), as the LCD is receiving data only. The RS (Register Select) input allows commands to be sent to the display. RS selects command/data mode. The display itself contains a microcontroller; the standard chip in this type of display is the Hitachi HD44780. It must be initialized according to the data and display options required. The module can be used 4-bit or 8-bit mode. The development board uses 4-bit interface. Data pins are P1.20-P1.23 and control pins are P1.17(RS),P1.18(R/W) and P1.19(E). LCD contrast can be adjusted by using the potentiometer.



2.12. PULL-UP KEYPAD

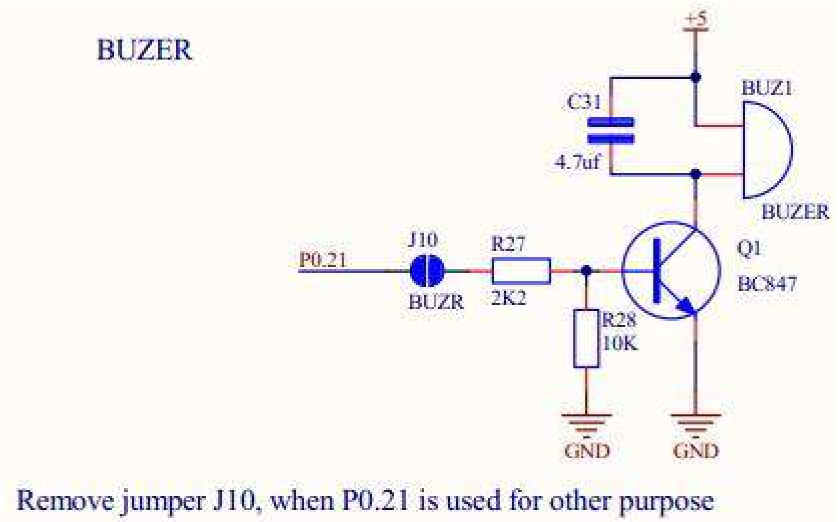
The simplest input to a microcontroller is a switch or push button. This can operate with just one additional support component, a pull-up resistor. The board has 3 externally pulled up switches (SW1,SW2 & SW3) connected to port pins P0.14, P0.15 & P0.16 via jumpers J4, J5 & J6 respectively. On shorting these jumpers, the switches can be used as general pull-up keypad and if the jumpers are left open, then the port pins can be used for other purposes. When the key is pressed, it connect the input pin to the ground via a small value resistor. Thus input pin get logic low value.



Note : *Remove J4,J5,J6 when P0.14, P0.15 & P0.16 are used for other purpose.*

2.13. BUZZER INTERFACING

Buzzer is a simple I/O device. Normally we use piezo electric element as buzzer. Buzzer is driven using a simple NPN transistor with biasing. The transistor's base is connected to P0.21 of the microcontroller via jumper J10. If the port pin is configured as output pin and logic high, the transistor will be triggered on which in turn switch on the Buzzer. If logic low is provided, the buzzer will be turned off.



Note : *Remove J10 when P0.21 is used for other purpose*

2.14. UNIVERSAL ASYNCHRONOUS RECEIVER TRANSMITTER (UART)

LPC2129 has two UART modules namely UART0 and UART1. For UART0 communication transmission & reception pins are respectively P0.0 & P0.1. UART1 communicates through P0.8(TXD1) and P0.9(RXD1).

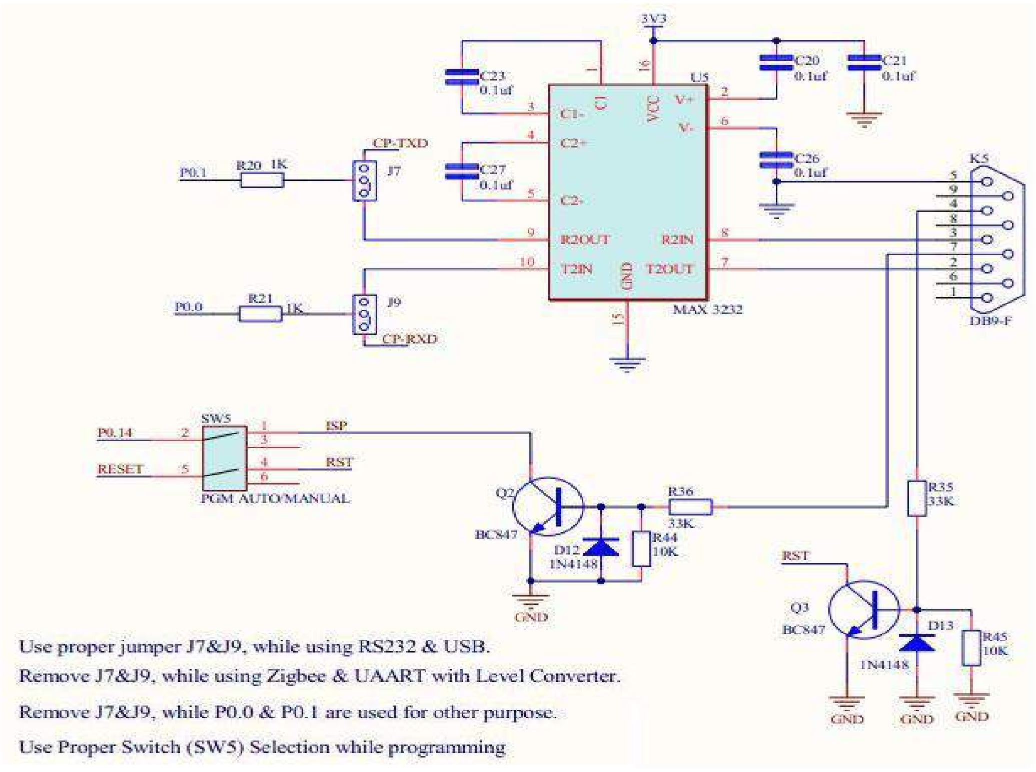
- In the mini development board, UART0 can communicate through
- Serial port via MAX232
- USB port via CP2102
- RMC connector (GND,TXD0,RXD0, Vout) in 3.3V/5V levels
- Zigbee connectors on either side of the board

UART0

UART0 communication via **USB/Serial** port is selected using jumpers **J7** and **J9**. Through RMC connector, UART0 can be used in two voltage levels of **3V3/5V** which can be selected by jumper **J16**.
Note: While using UART0 for communication, PROGRAMMER switch should be in manual mode

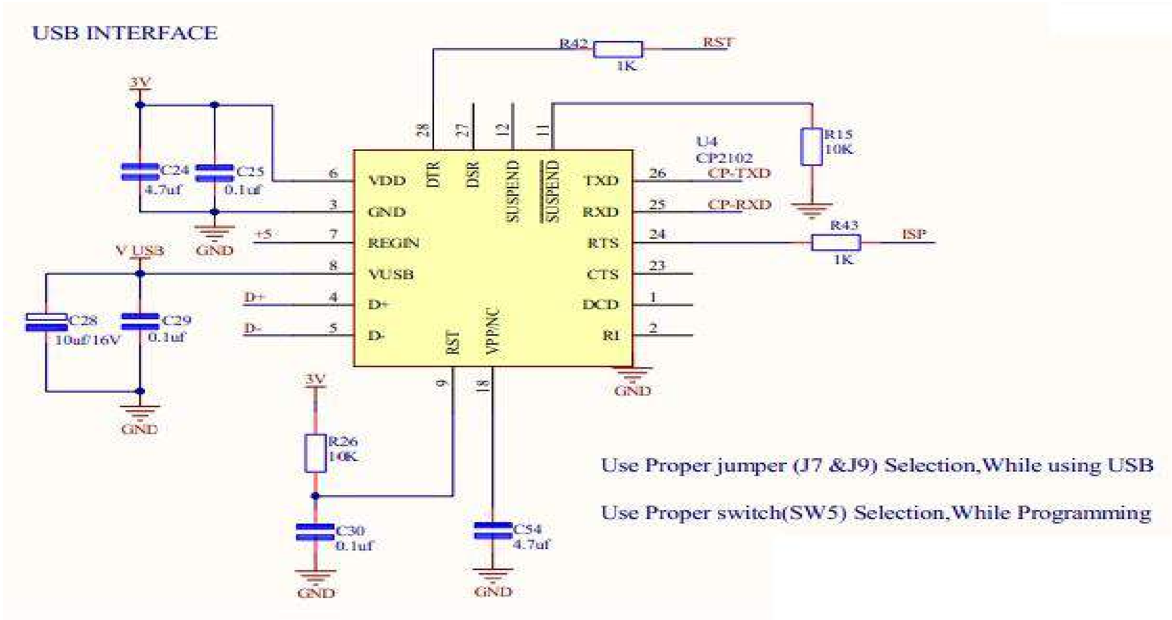
- **RS232 Interface via DB9 connector**

The RS232 interfacing is done by using the serial driver IC MAX 232 and a DB9 connector. The MAX232 is an IC that converts signal from RS232 serial port to signal suitable for use in TTL compatible digital logic circuit. The MAX 232 is a dual driver/ receiver and typically converts RX, TX,CTS and RTS

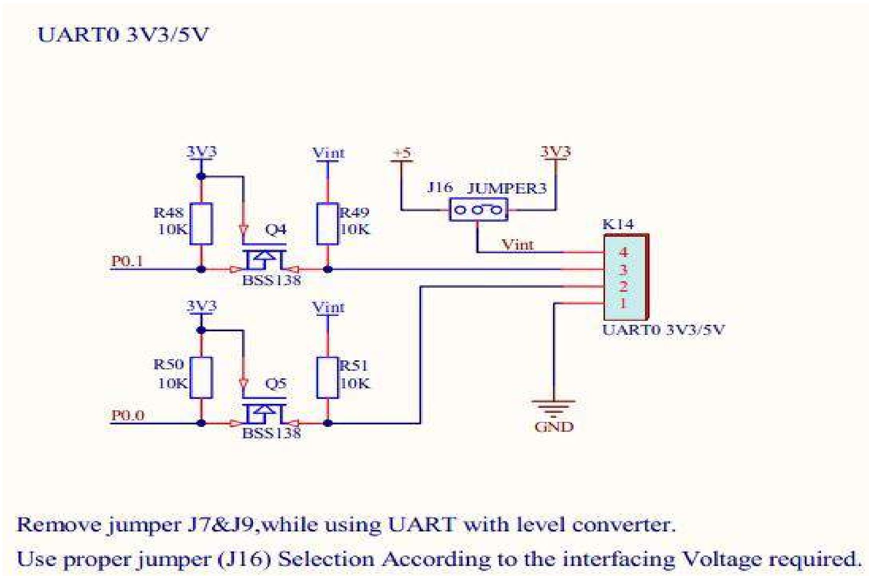


- **USB Interface using CP2102**

The CP2102 is a highly-integrated USB-to-UART Bridge Controller providing a simple solution for updating RS-232 designs to USB using a minimum of components and PCB space.The CP2102 includes a USB 2.0 full-speed function controller,USB transceiver,oscillator ,EEPROM,and asynchronous serial data bus (UART) with full modem control signals in a compact 5x5 mm MLP-28 package. No other external USB components are required.



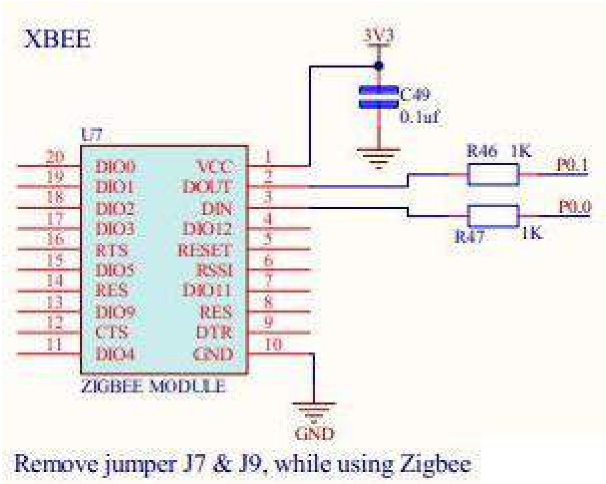
- **3V3 /5V UART0**



Note: *Short J7 & J9 while using 3V3 UART. Remove J1&J2, when you connect 3V3 UART*

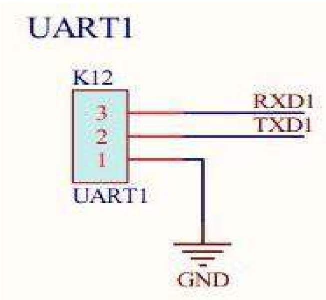
- **Zigbee Module Interfacing**

ZigBee is a wireless networking standard that is aimed at remote control and sensor applications which is suitable for operation in harsh radio environments and in isolated locations.ZigBee technology builds on IEEE standard 802.15.4. Rhydolabz ARM LPC2129 mini development board zigbee interfacing can be done from both bottom and top of the board. Communication with the ZigBee module uses a standard UART interface compatible with 3V3.



Note: *Remove jumpers J7&J9, while using Zigbee.*

UART1



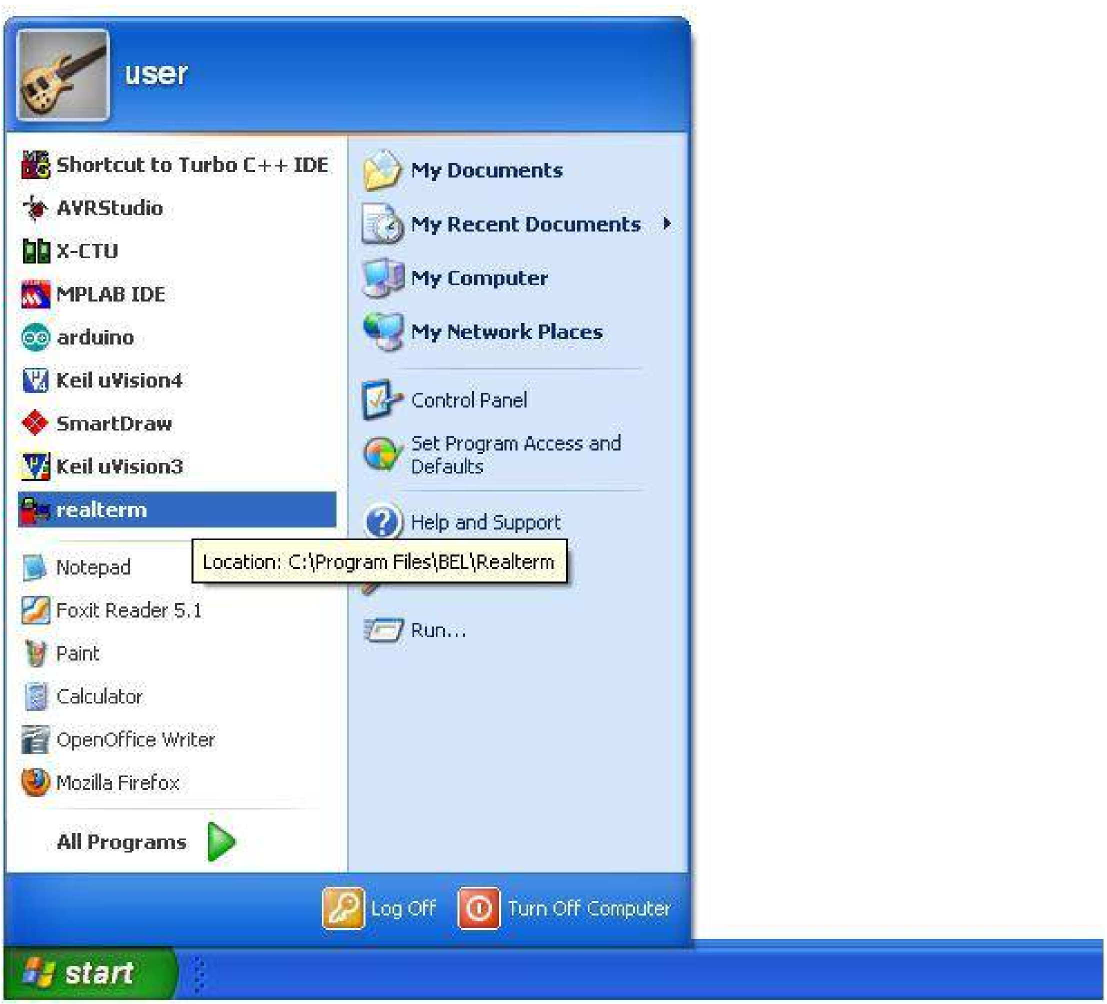
USING REALTERM IN PC

The RealTerm Software

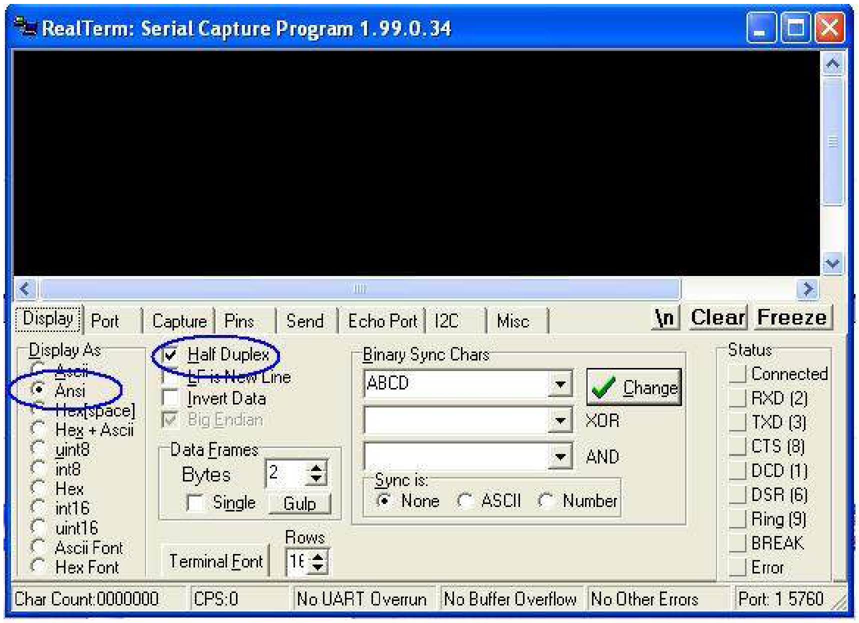
The serial data transmitted through UART can be viewed on a PC using the realterm software.

The following section provides step by step tutorial of serial communication using realterm software. The realterm software can be downloaded from http://realterm.sourceforge.net/

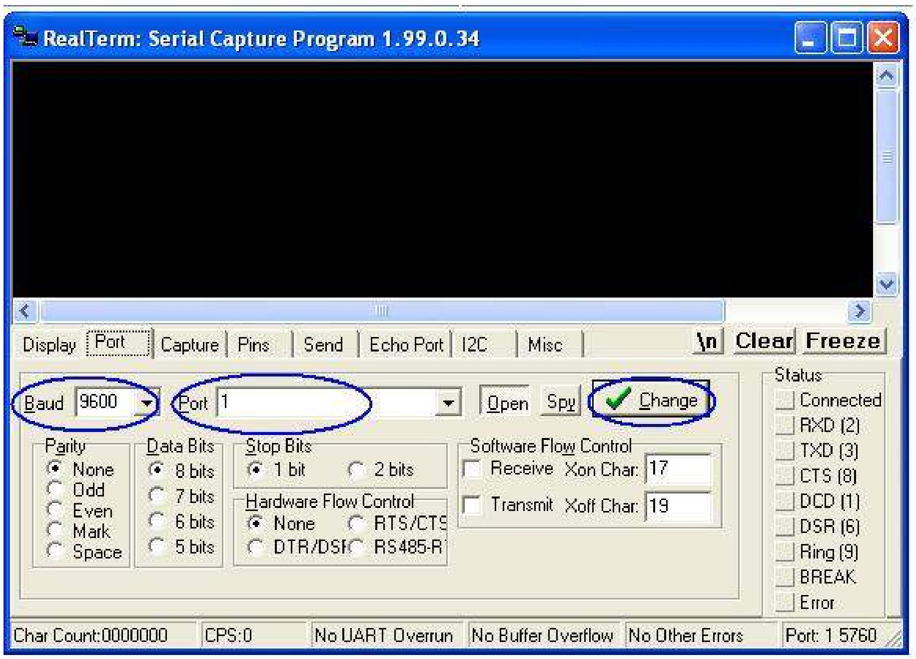
Step 1 : Open realterm software from Windows Start menu ⟹ All Programs ⟹ Real Term



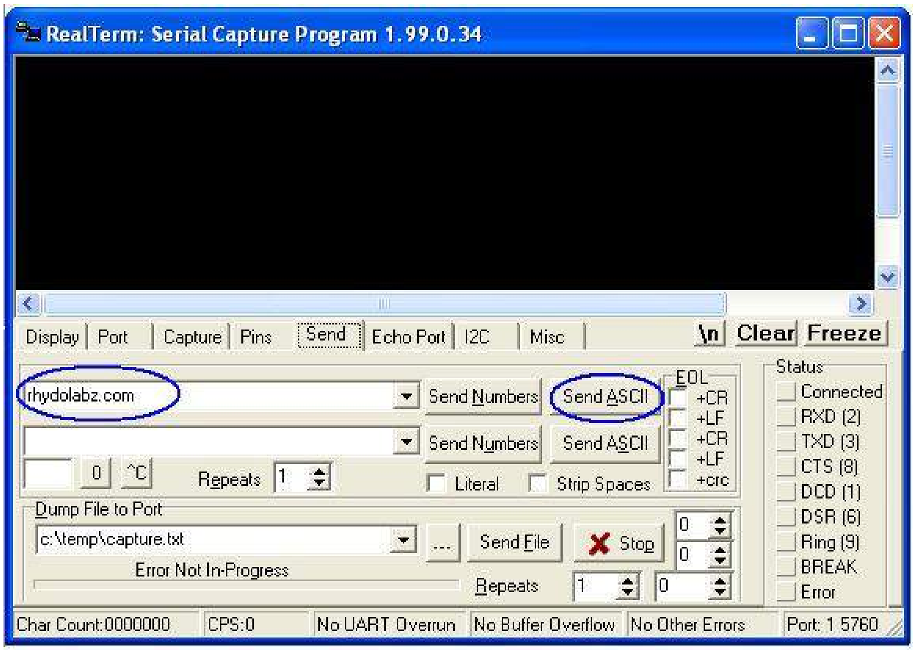
Step 2: ***Display Tab***- Here the output text format selected is ANSI and Half Duplex mode is enabled to view the data sent by the user.



Step 3: ***Port Tab***-To test the connection - make sure the **Open** button is pressed, Select required baud rate and the "Port" dropdown here, select the number of your COM port and then press the **Change** button.

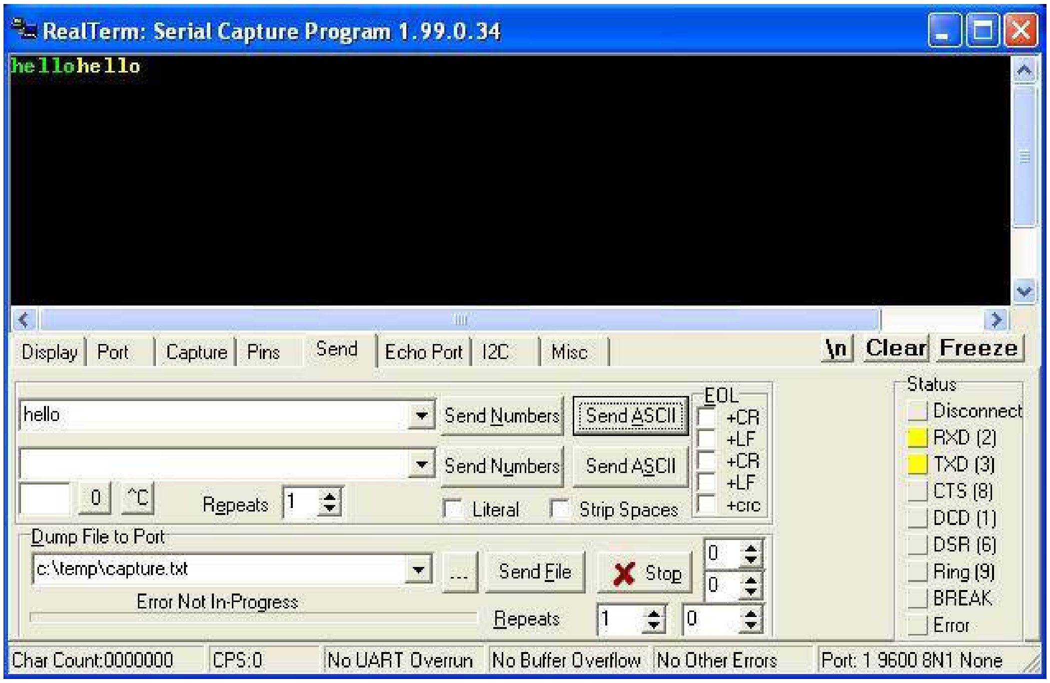


Step 4: ***Send Tab-*** Insert the desired data to be transmitted and press "Send ASCII" button.



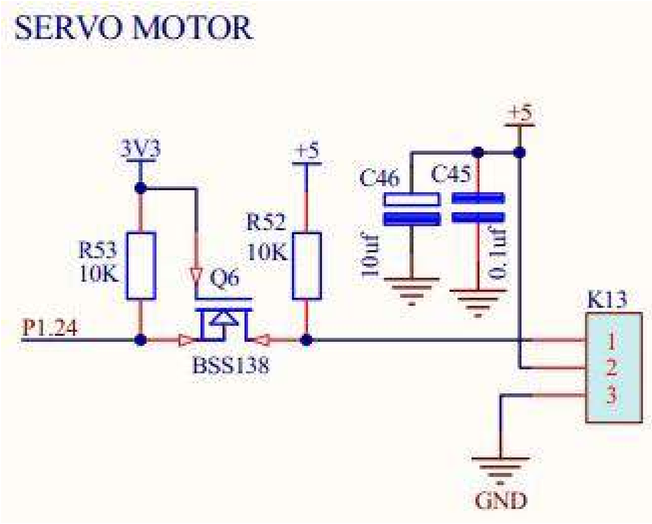
Step 5 : The output after data transmission to the controller is shown in the following diagram. The text sent by user and controller is highlighted by callouts in the figure.

Step 6: To check reception, go to **Send** option, type the string in the space provided(encircled in green) and click **Send ASCII** button. The first "hello" in green color is transmitted from PC & that in yellow color is retransmitted by the controller



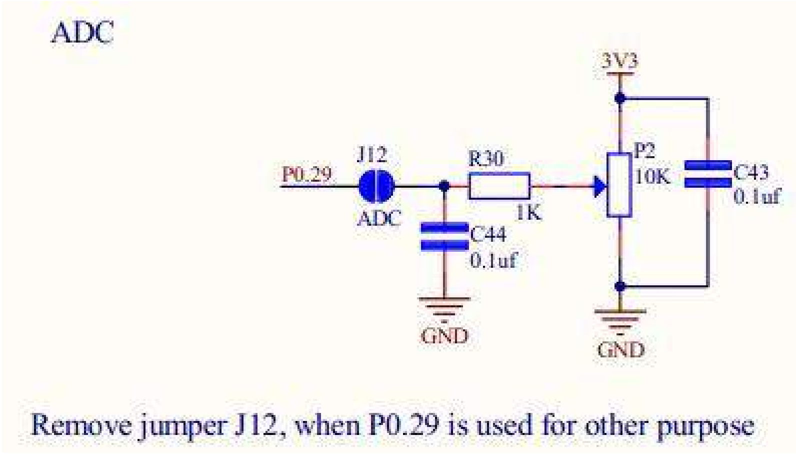
2.15. SERVO MOTOR INTERFACING

Servos are small mechanical motorized devices whose sole purpose is to rotate a tiny shaft attached to a servo wheel in a specified position. Servos are controlled by sending a pulse width signal from an external electronic device that generate PWM signal values. PWM signal send to the servo are translated into position values by electronics inside the servo. In the mini development board, servo is connected to P1.24 with jumper connection at K13.



2.16. ADC POTENTIOMETER INTERFACING

LPC 2129 mini development board has a potentiometer connected to its ADC pin P0.29 (channel2) via jumper J12.

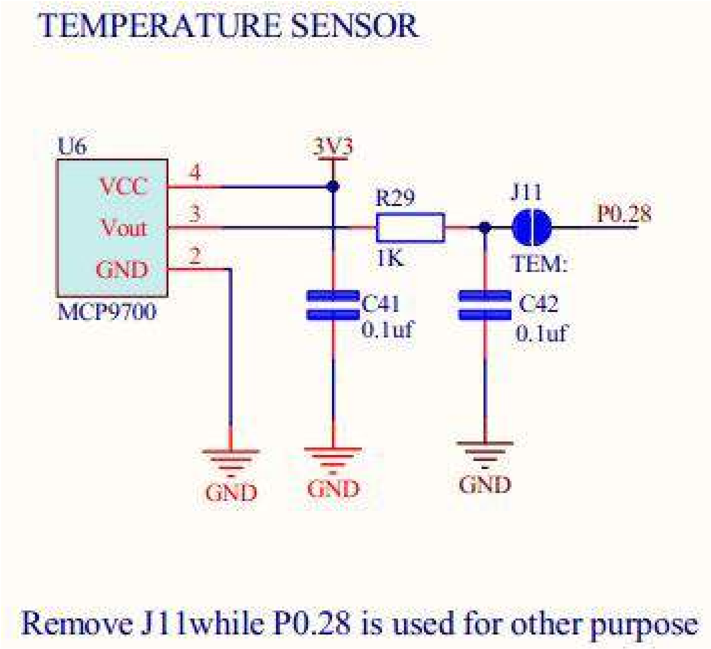


.

Note : *Remove J12 when P0.21 is used for other purpose*

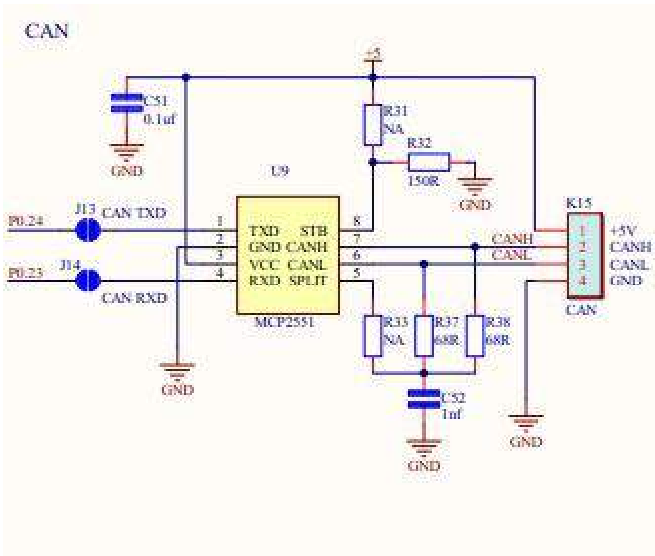
2.17. TEMPARATURE SENSOR INTERFACING

MCP 9700 temperature sensor can be used to measure temperature. It is connected to P0.28(channel 1) via jumper J11. .



2.18. CONTROLLER AREA NETWORK (CAN) TRANSCEIVER

Controller Area Network (CAN) transceiver is the most peculiar feature of ARM LPC2129 .Available CAN Controller MCP 2551 in on-board mini .CAN connection taken from RMC connector (+5V, CANH, CANL, GND) .Communication provided with Jumper selection at CAN RX & CAN TX.



SOFTWARE DEVELOPMENT

3.1. FAMILIARIZATION of Keil µVision4

CREATING A PROJECT

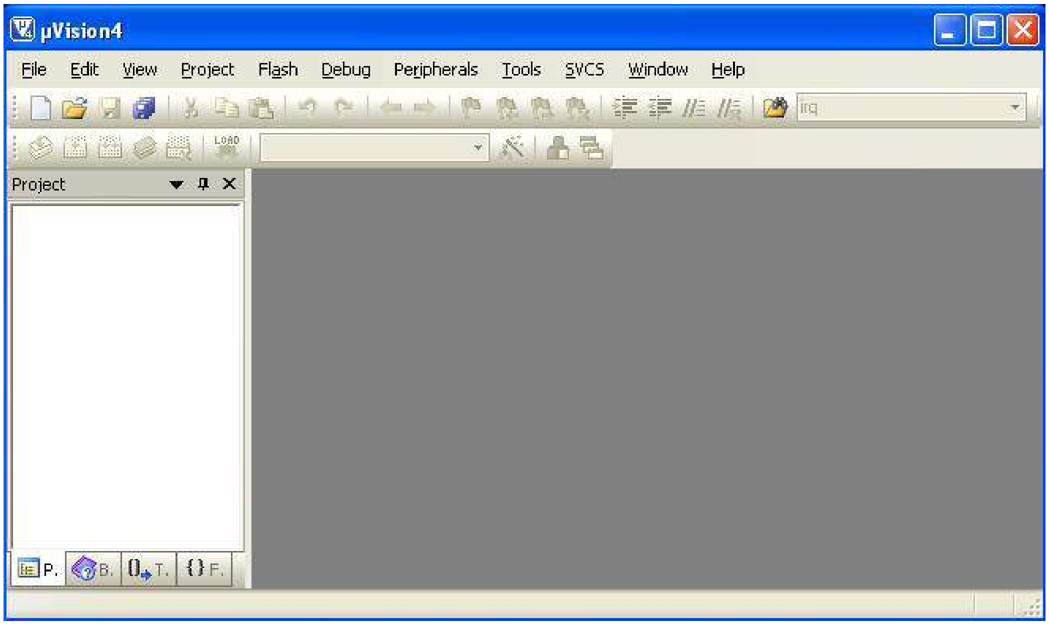
µVision4 is a standard Windows application and started by clicking on the program icon. µVision4 includes a project manager which makes it easy to design applications for an ARM microcontroller. You need to perform the following steps to create a new project:

- Open Keil µVision4 from start menu or Desktop shortcut
- Create new Project File and Select CPU.
- Create New Source Files.
- Add Source Files to the Project.
- Set Tool Options for Target Hardware.
- Configure the CPU Startup Code.
- Create a HEX File.
- Build Project and Generate Application Program Code.

The section provides a step-by-step tutorial that shows you how to create a simple Keil µVision4 project.

Launch Keil µVision4

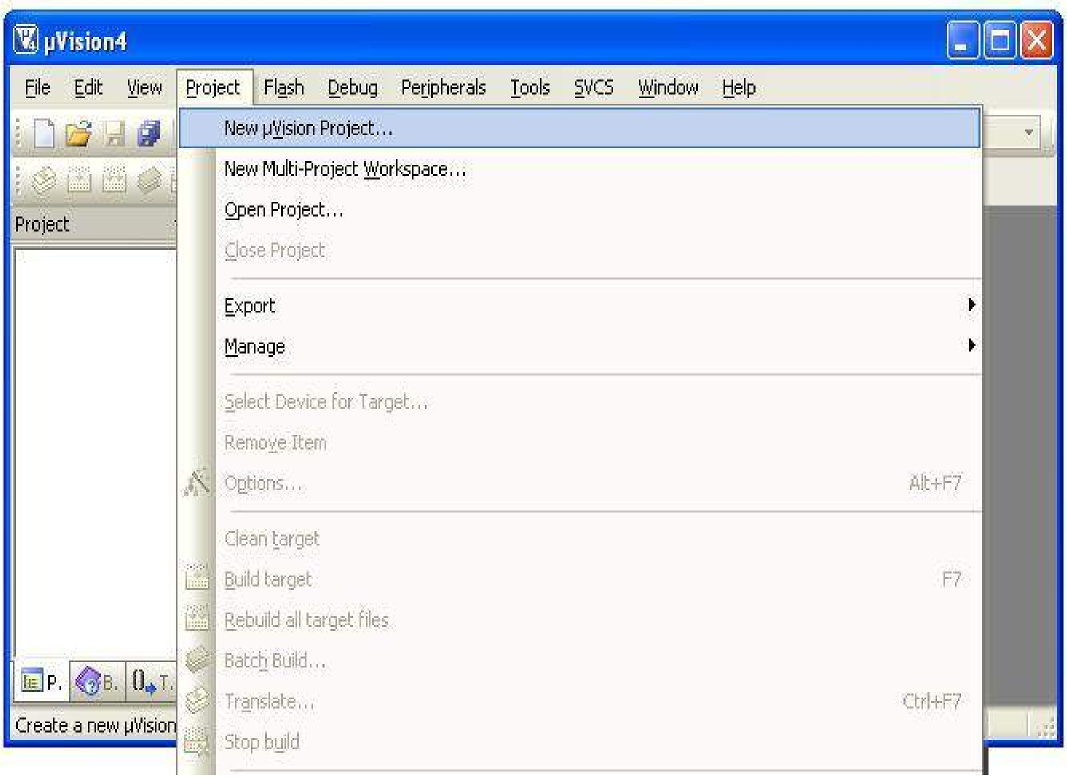
The Keil µVision window opens as shown below



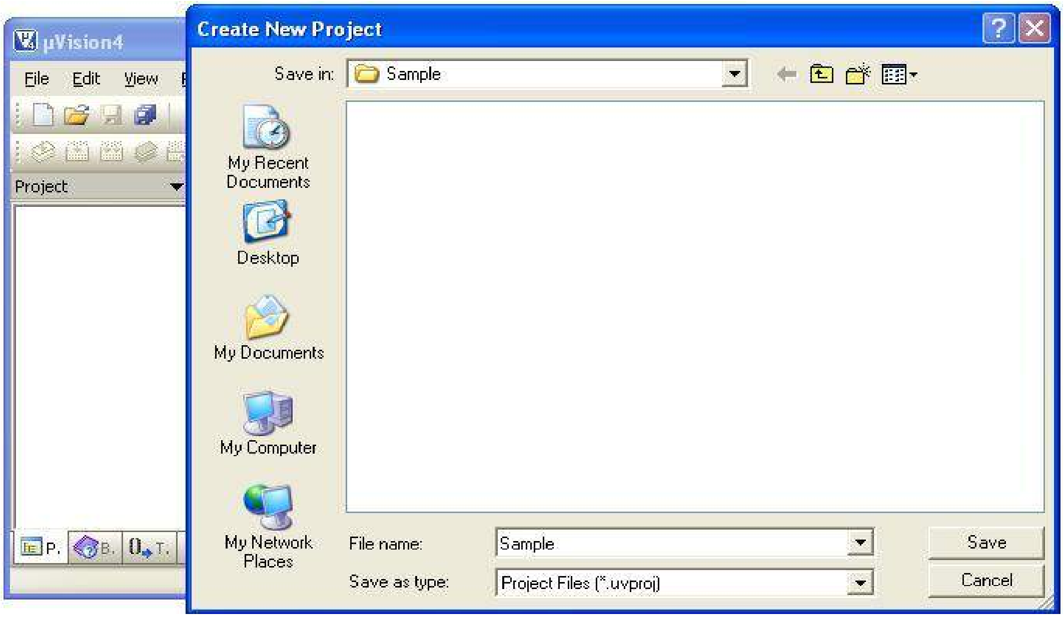
Create new Project File and Select CPU.

This section provides a step-by-step tutorial that shows you how to create a simple Keil µVision4 project.

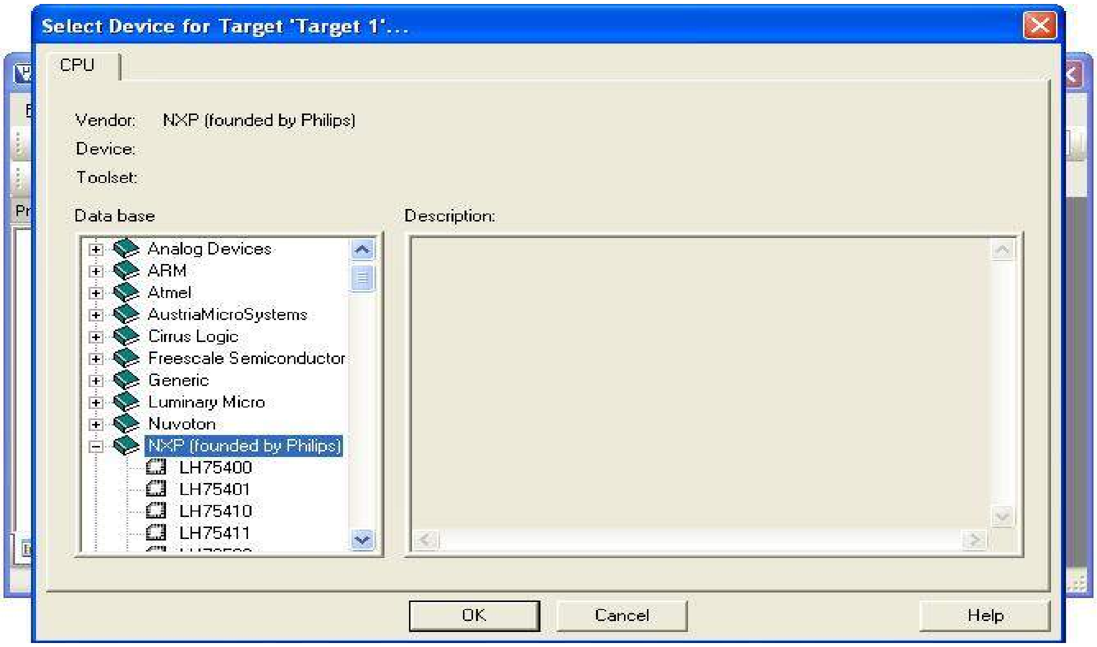
Step1 :To create a new project, select ***Project > New µVision*** Project from menu bar



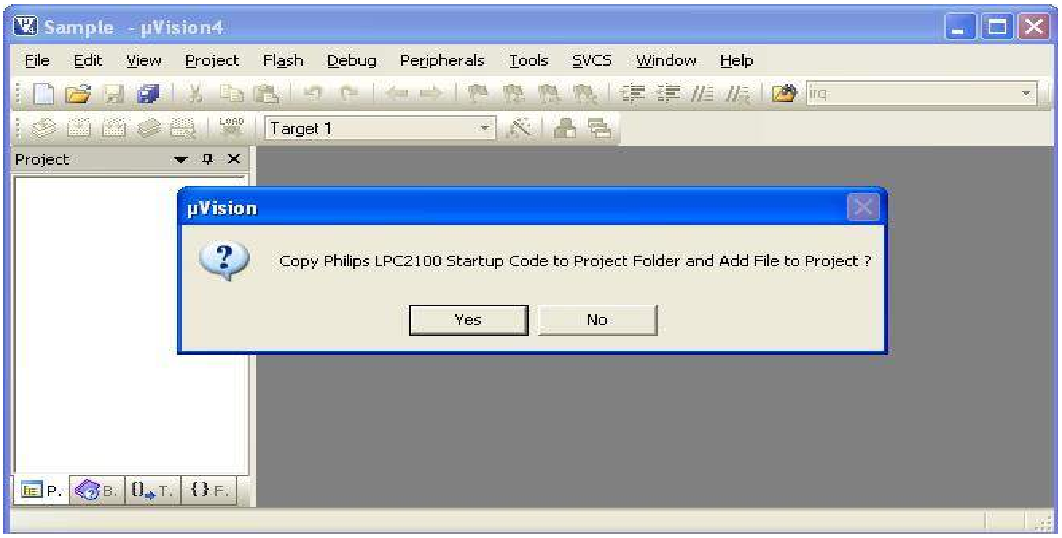
Step 2 : Save the project in a suitable location with appropriate name



Step 3: The following window opens. When you create a new project Keil µVision4 asks you to select a CPU for your project. The Select Device dialog box shows the µVision4 device database. Just select the microcontroller you use. For the example in this chapter we are using the ARM LPC2129 controller. Select LPC 2129 (listed under NXP) from the drop-down list and simplifies in this way the tool configuration ,

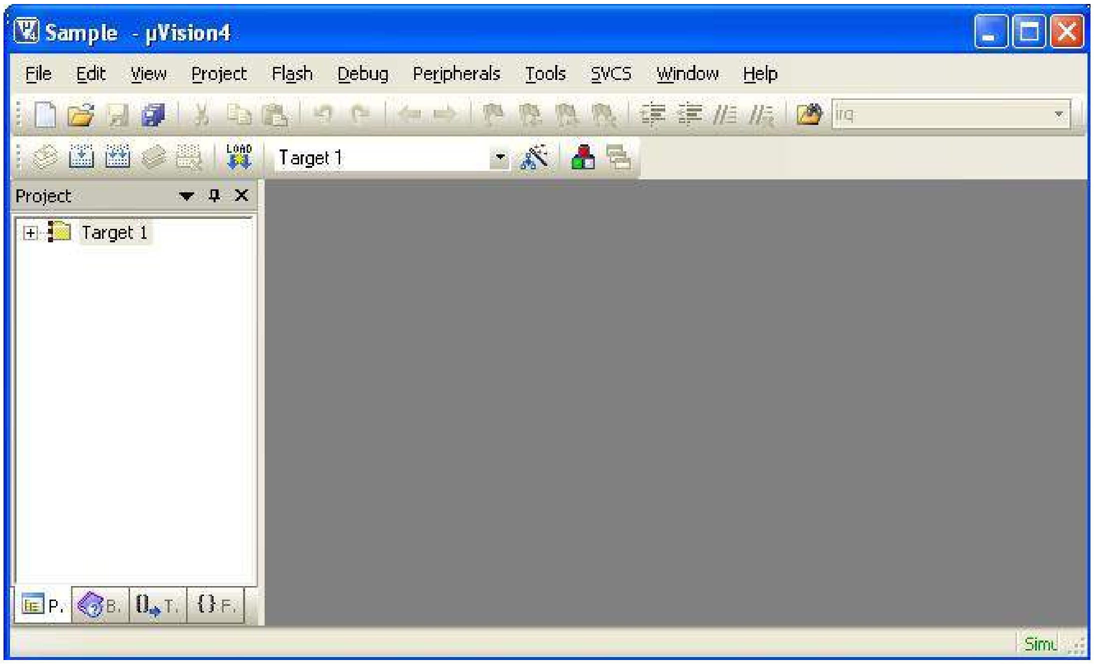


Step 4: An embedded program requires CPU initialization code that needs to match the configuration of your hardware design. This Startup Code depends also on the tool chain that you are using. Since you might need to modify that file to match your target hardware, the file should be copied to your project folder. For most devices, Keil µVision4 asks you to copy the CPU specific Startup Code to your project. This is required on almost all projects (exceptions are library projects and add-on projects). The Startup Code performs configuration of the microcontroller device and initialization of the compiler run-time system. Answer with YES to this question.



Note: The CPU Startup Code typically requires some configuration;however the default configuration gives you a good starting point for single chip applications.

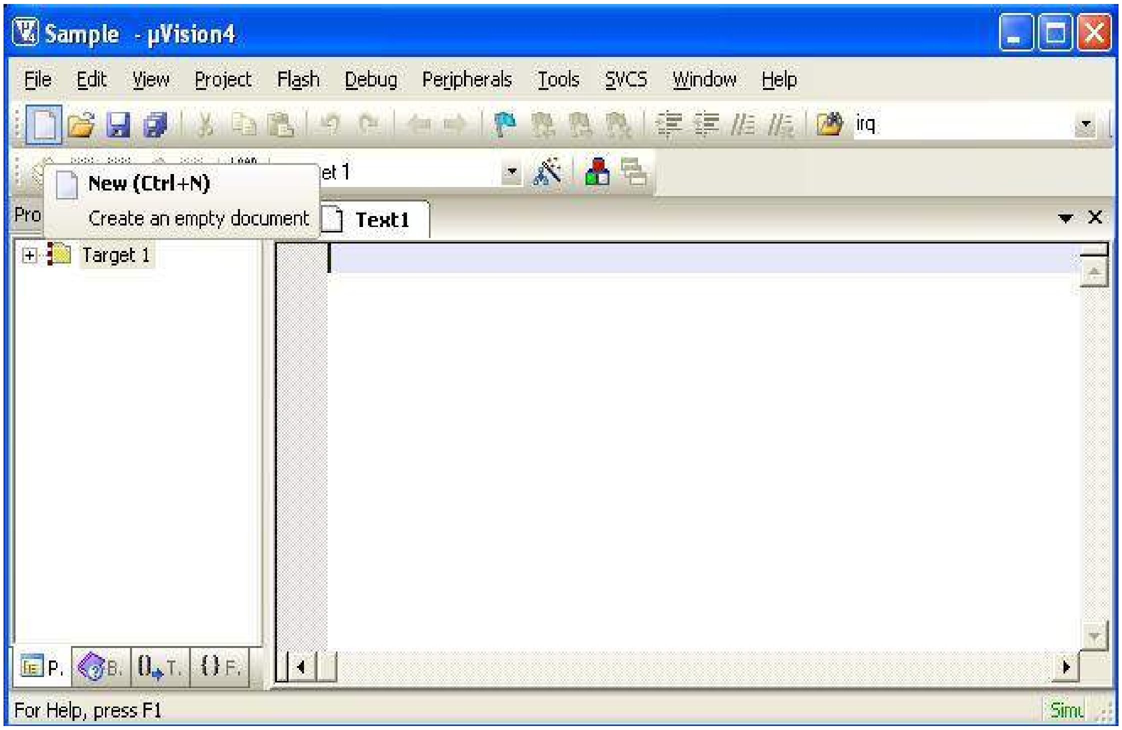
Step 5: This creates a target to the project



Create New Source Files

You may create a new source file with the menu option File – New. This opens an empty editor window where you can enter your source code. µVision3 enables the C color syntax highlighting when you save your file with the dialog File – Save As… under a filename with the extension *.c. We are saving our example file under the name sample.c

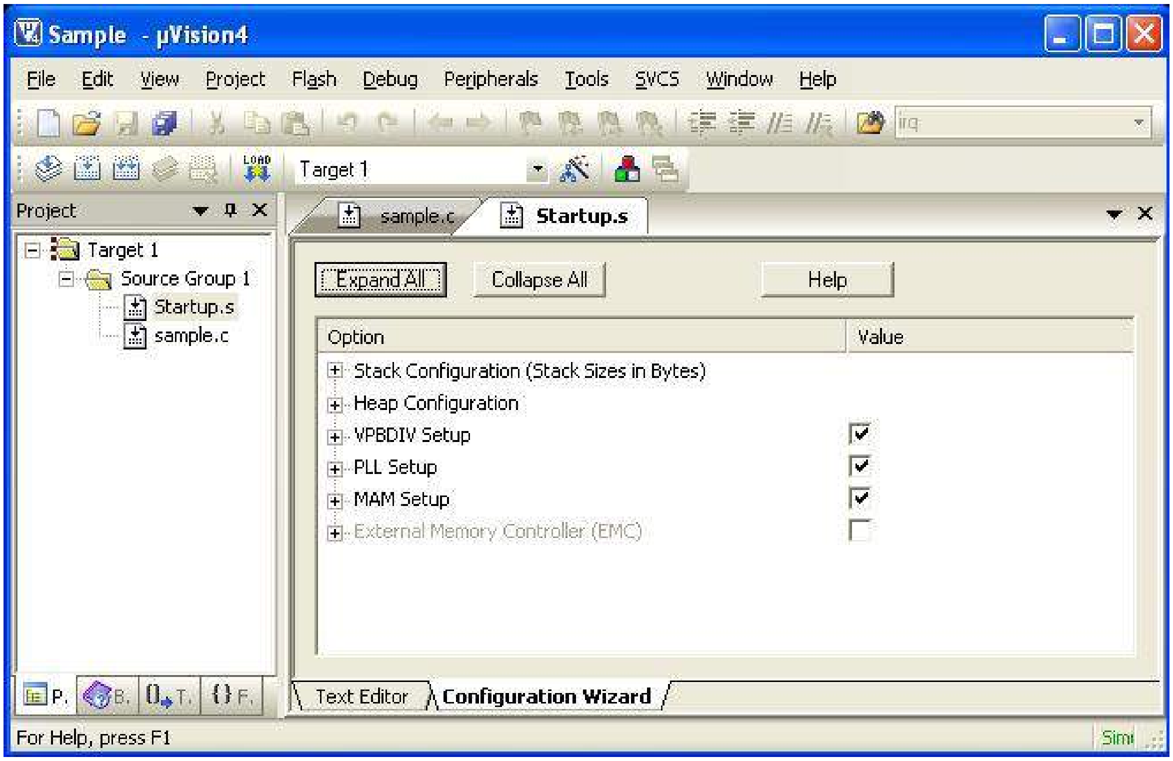
Step 6: Create a new file either by clicking the ***New File icon***, or by selecting ***File > New*** or using keyboard shortcut ***CTRL + N***



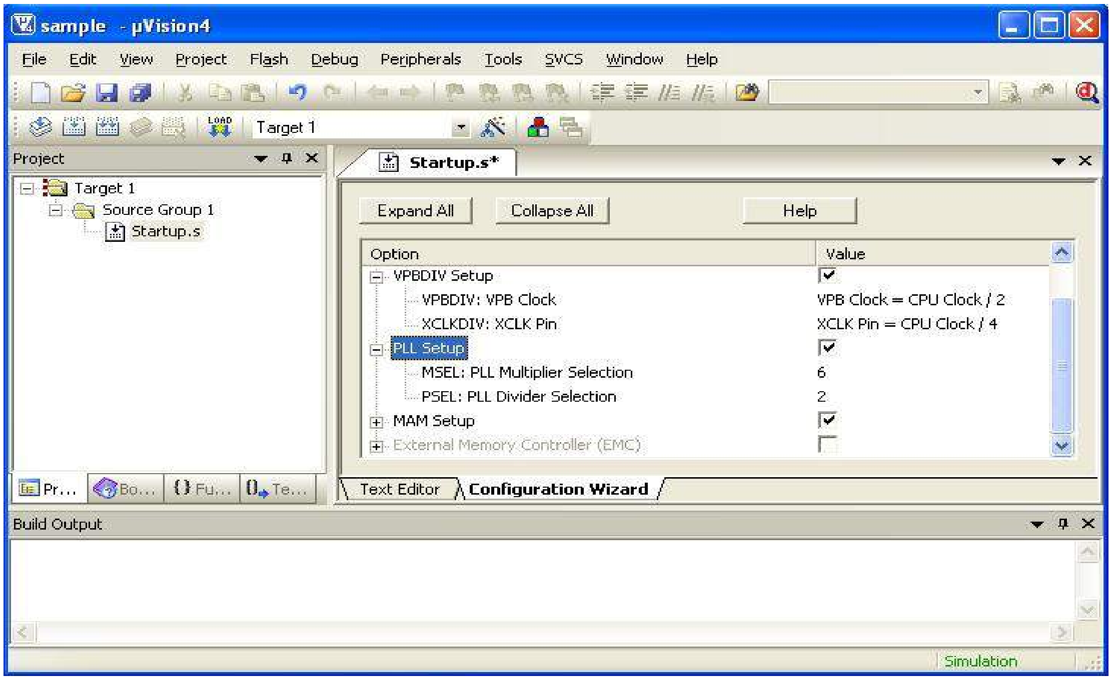

```
#include<lpc21xx.h>
void Delay(unsigned long val);

int main()
{
IOODIR  = OXFFFFFFFF;       /* Set Port0 as output                      */
while(1)                    /* Infinite loop                            */
{
IOOSET = 0X000E0000;        /* Set P0.17,P0.18,P0.19 at logic high state  */
Delay(1000000);             /* Delay of 100ms                           */
IOOCLR = 0X000E0000;        /* Set P0.17,P0.18,P0.19 at logic low state   */
Delay(1000000);
}
}

void Delay(unsigned long val)
{
while(val>0)
{
val--;
}
}
```

Step 7*:* Save the file with ***.c extension*** **in the project folder**

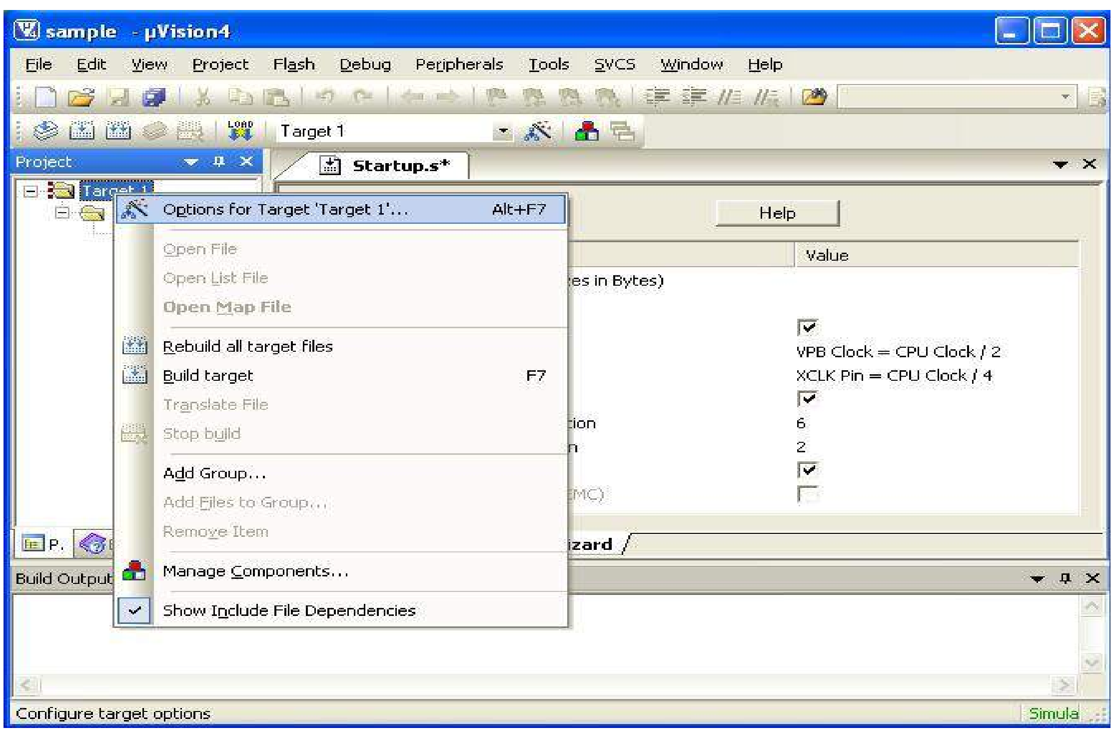
Step 8: Double click on ***"Startup.s"*** to open the configuration window



Step 9*:* Set the options as shown below and save the PLL setup is done for 10MHz crystal. The divider and multiplier must be selected such that the PLL output is 30MHz((10/2)*6). If crystal frequency is changed, then these values must be changed accordingly

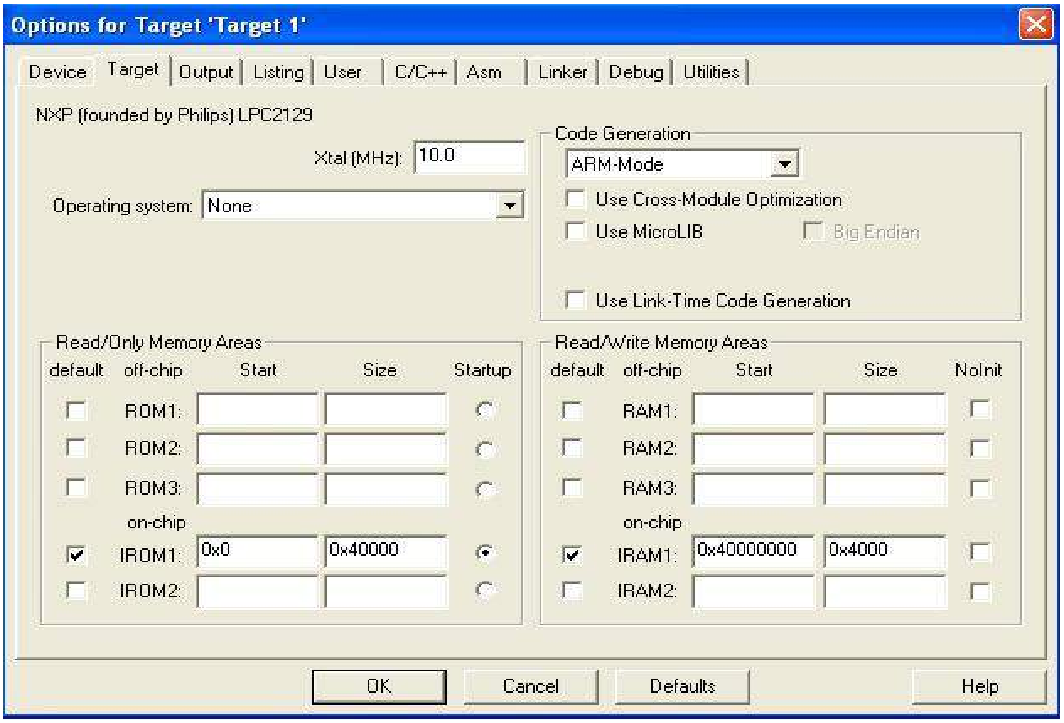


Step 10: *Right click on Target1* to set target file options. You can also do this by using the *icon on* ***'Build toolbar'*** or ***Project > Options for Target 'Target 1***

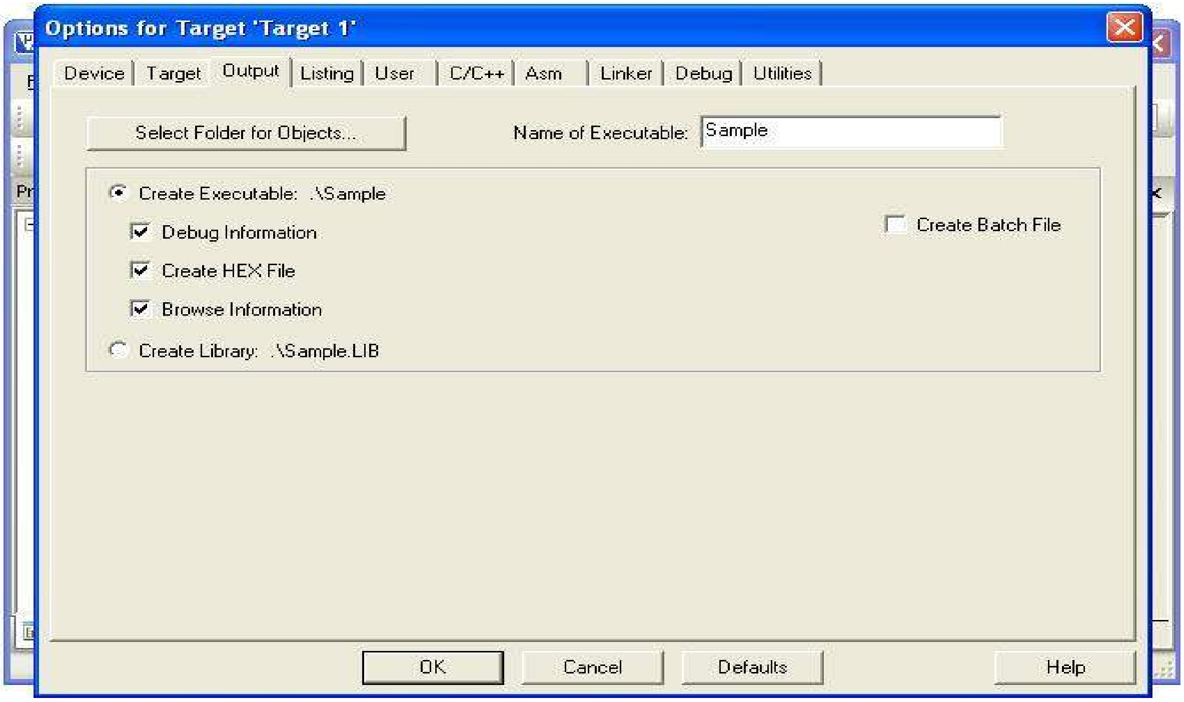


Step 11: Configure **Target, Output and Linker** options as shown below

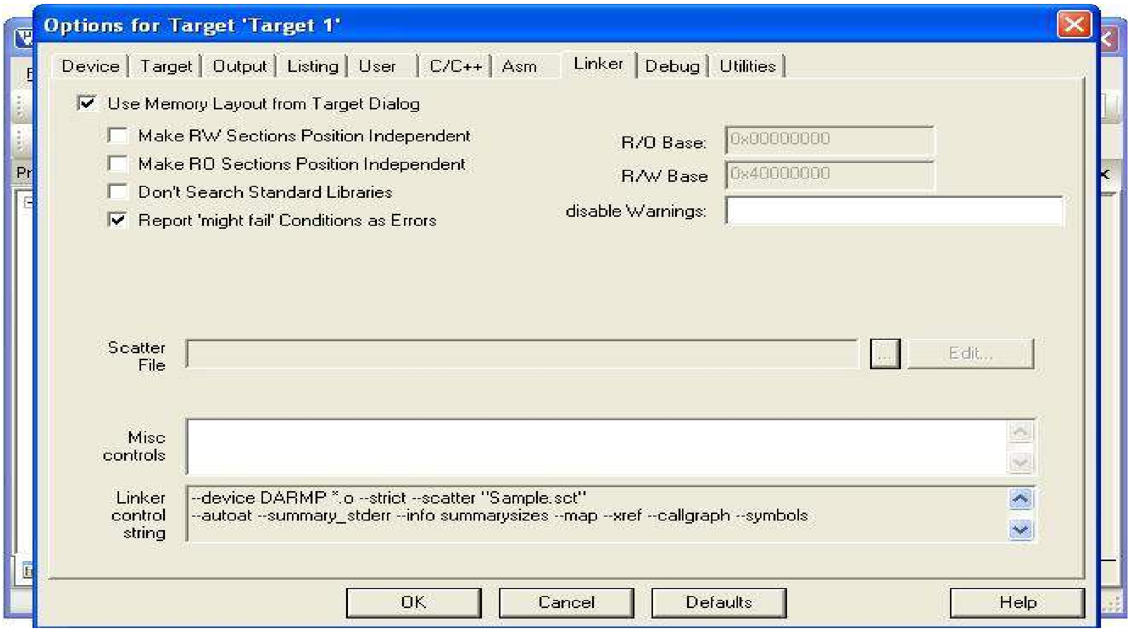
<u>Target</u>



<u>Output</u>

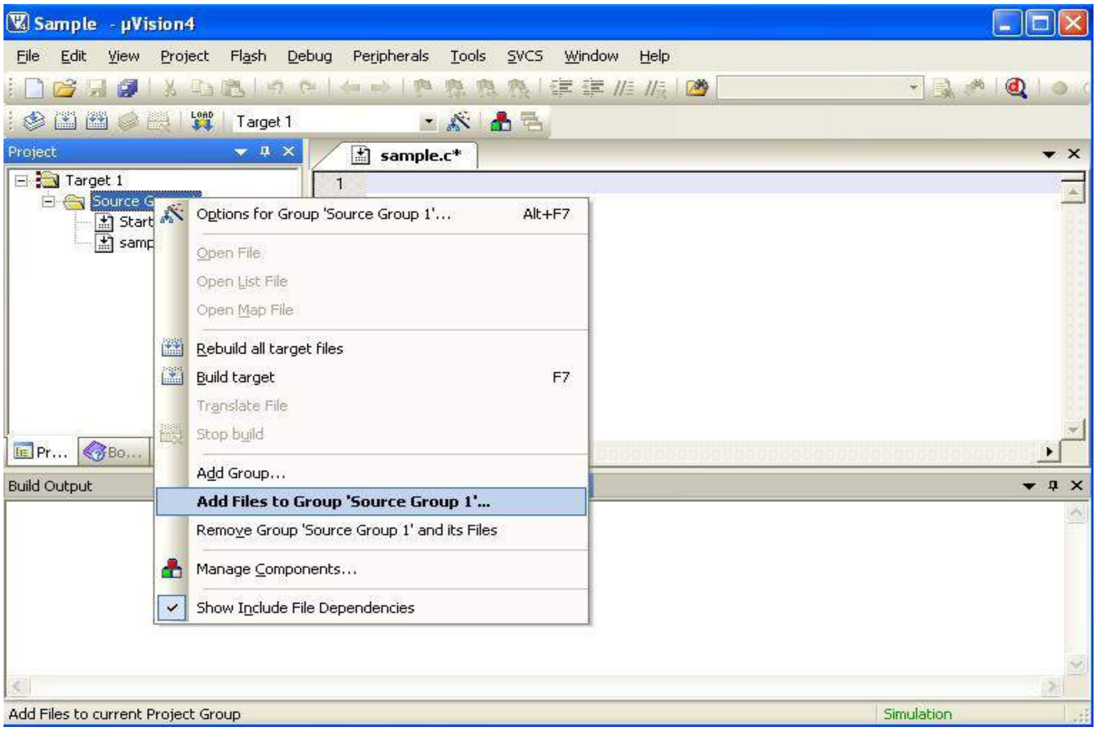


Linker

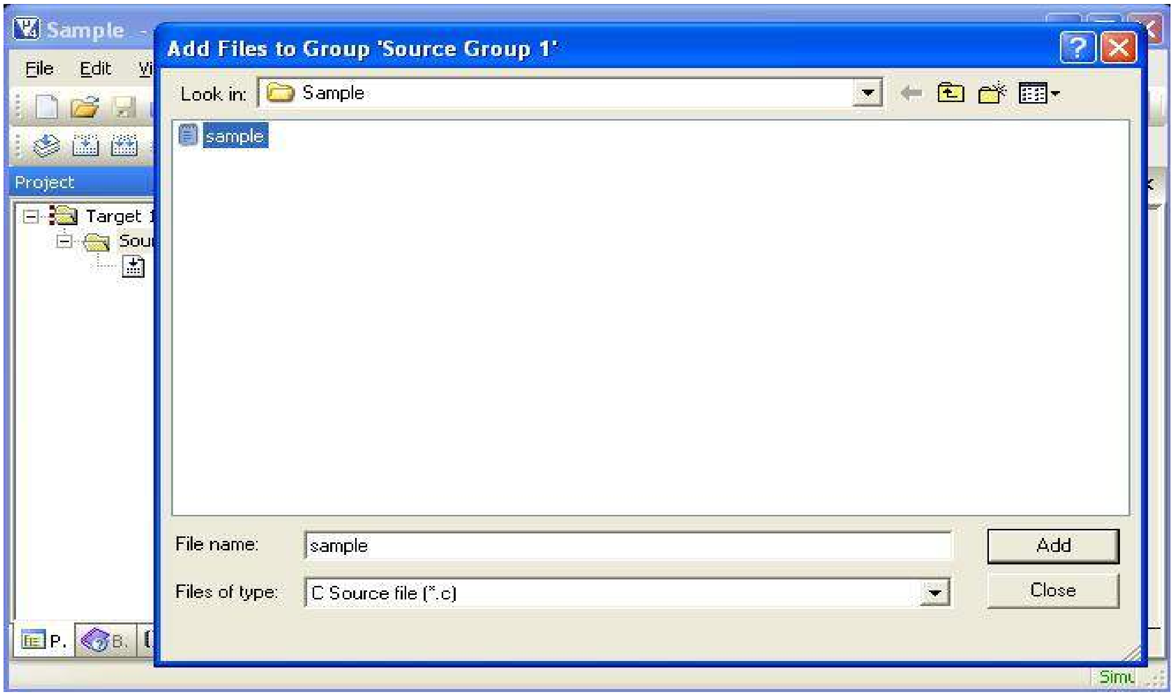


Add Source Files to Project

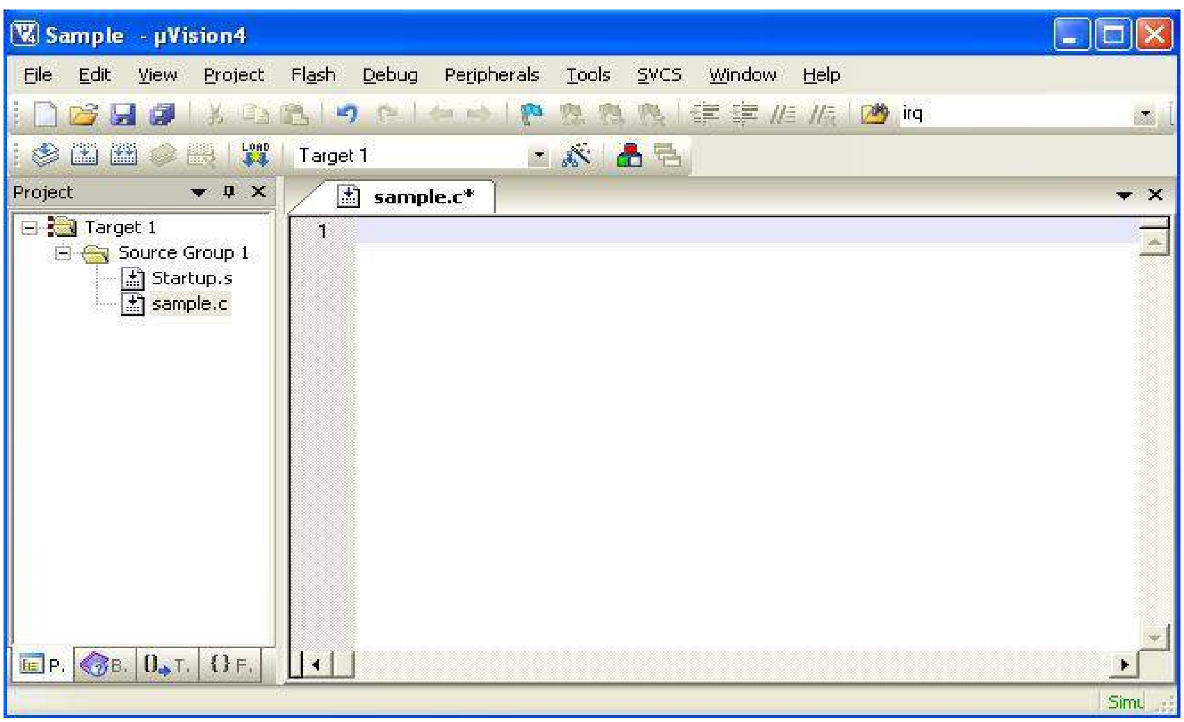
Step 12: Right click Source Group 1 to add C file to source group



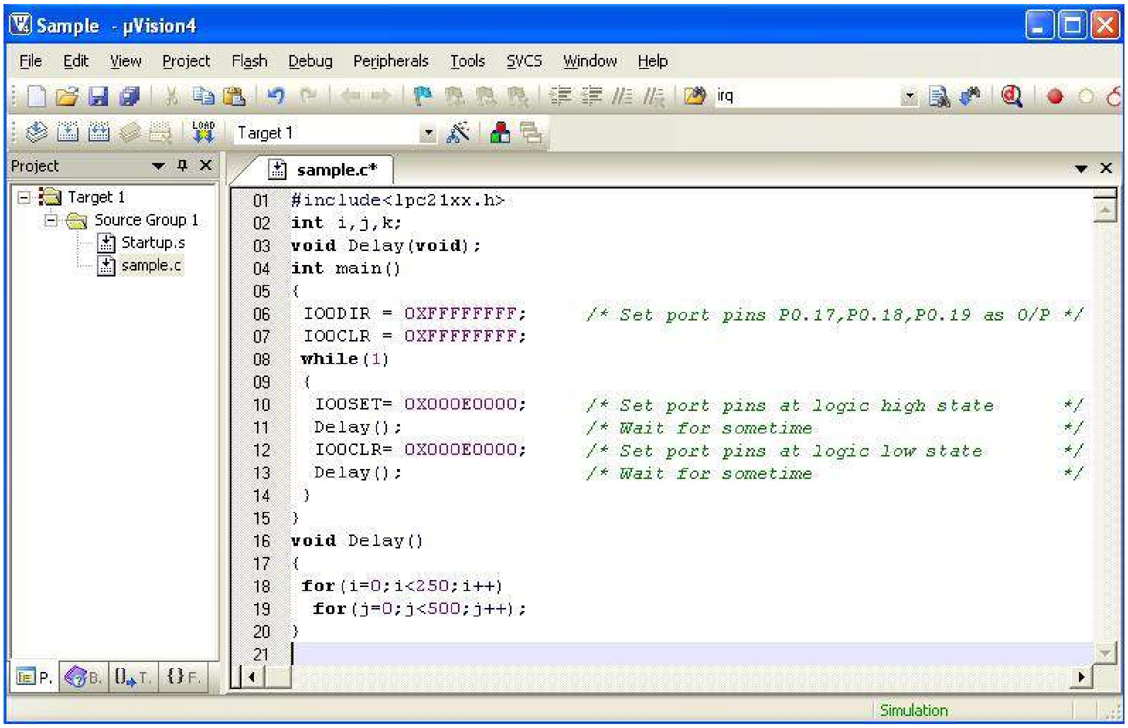
Step 13: Select the C file created and cilck Add



Step 14: Now the c file gets added to the Source



Step 15: Type the code

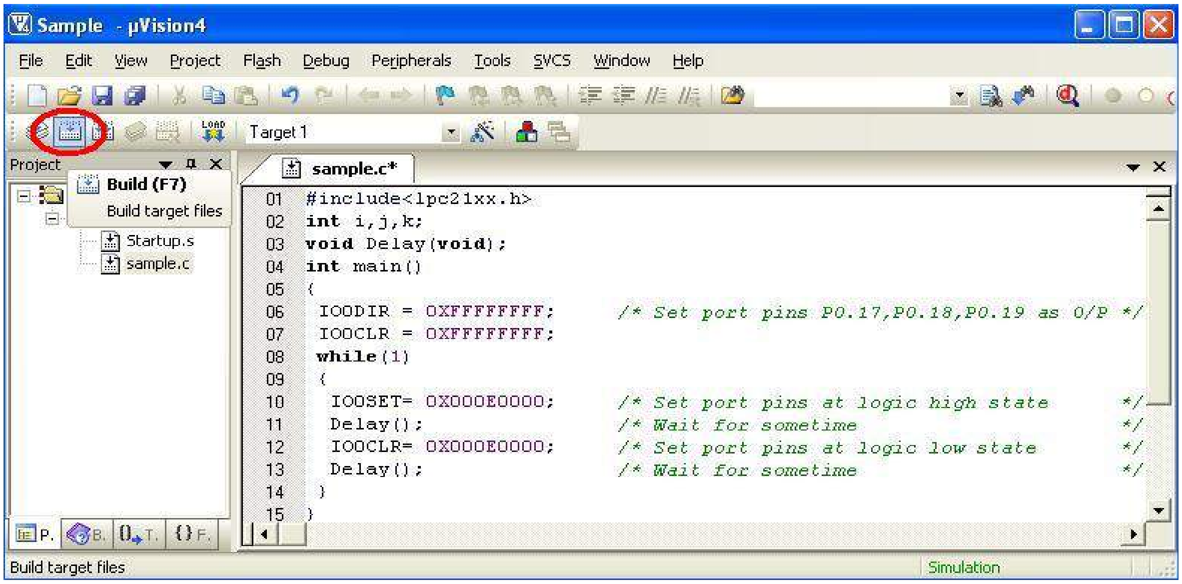


Create HEX File

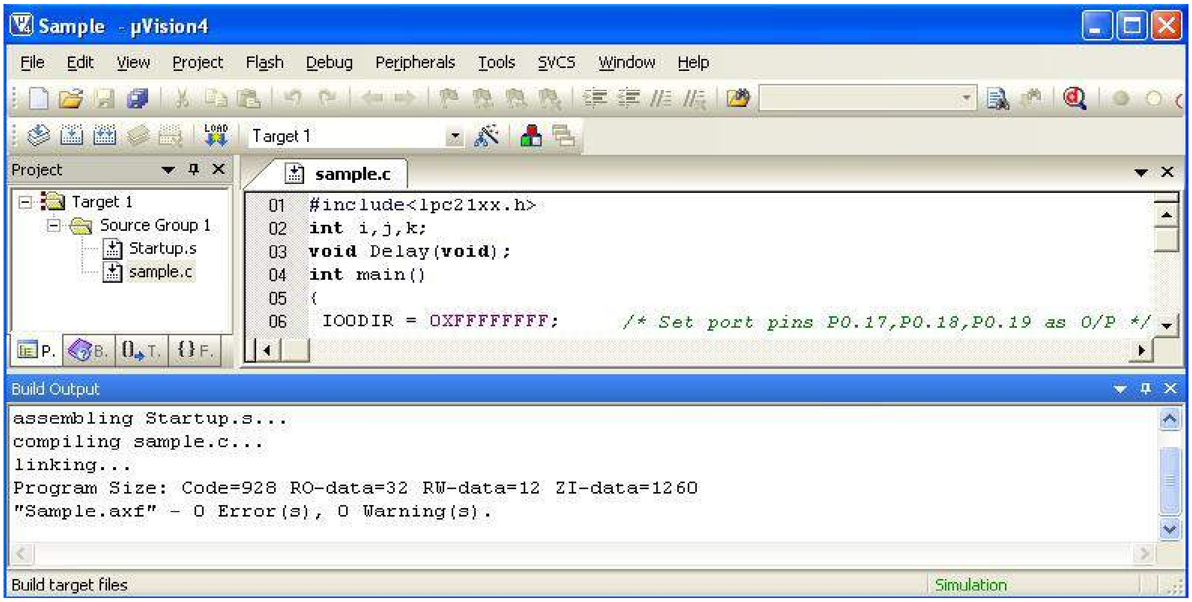
Step 16: Click the ***build icon*** (encircled in figure) to build the project. Errors (if any) get listed in the Build output window. Correct them and build again. On successful building, the hex file will be generated in the project folder

Build Project

Build option can be taken from ***Project > Build Target.***



Now the corresponding hex file of the program will be generated inside the working folder in the name of the project that we created. When you build an application with syntax errors, Keil µVision4 will display errors and warning messages in the **Build page/Build output** . A double click on a message line opens the source file on the correct location in the Keil µVision4 editor window. In this example the Hex file is **Sample.hex.** This file will be available in the folder Sample.



SETTING UP ARM LPC2129 mini

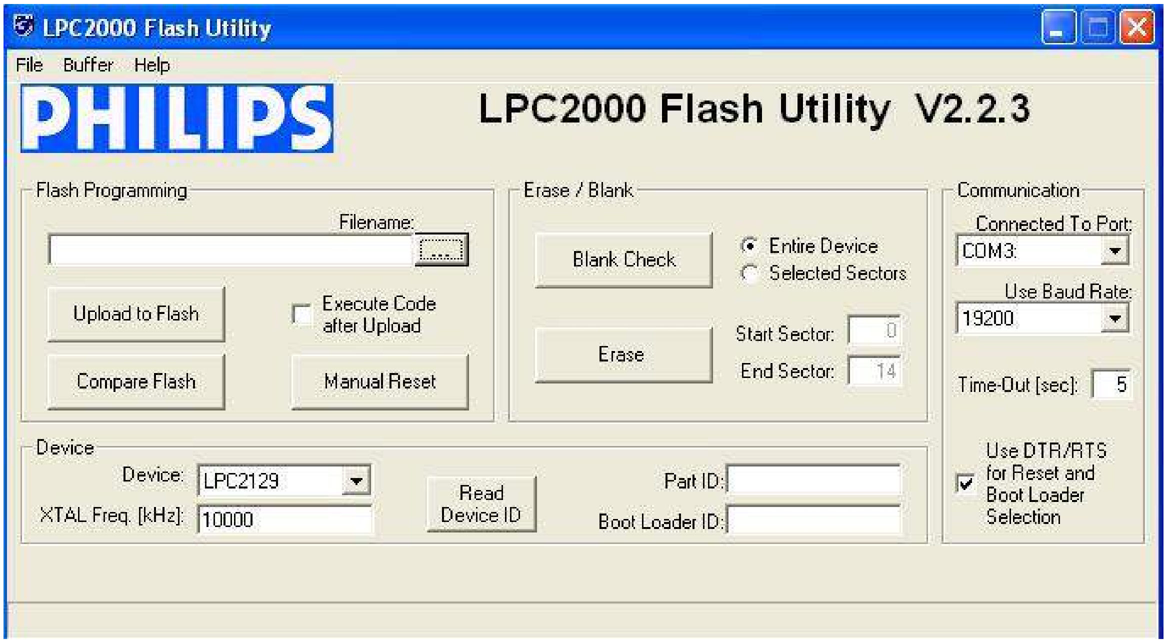
Now the code can be flashed to the controller in the board,

Note the following jumper connections

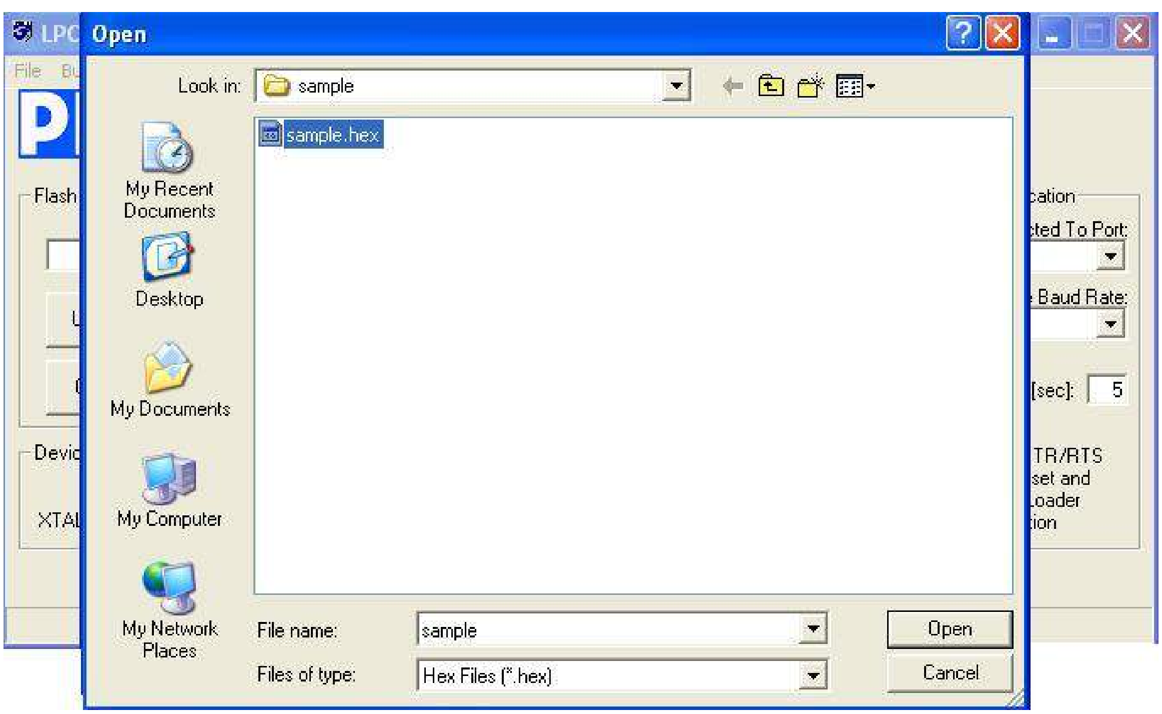
- Select the power source as USB cable or DC source
- Select USB or serial port using jumpers J7 & J9 for flashing the code
  Both jumpers on bottom side means USB programming
  Both jumpers on top side means RS232 serial programming
- Select mode using programmer switch
  In manual mode, insert ISP jumper and press reset button before programming
  In auto mode, leave it open and proceed to programming

PROGRAMMING STEPS

Now power up the board. The power LED(red LED on the board) glows. Open Flash Utility. Select the correct COM port recognized by PC and if its more than COM5 change it to any any lower COM port in Device Manager and select any suitable baud rate. Also select XTAL Frequency as 10000kHz

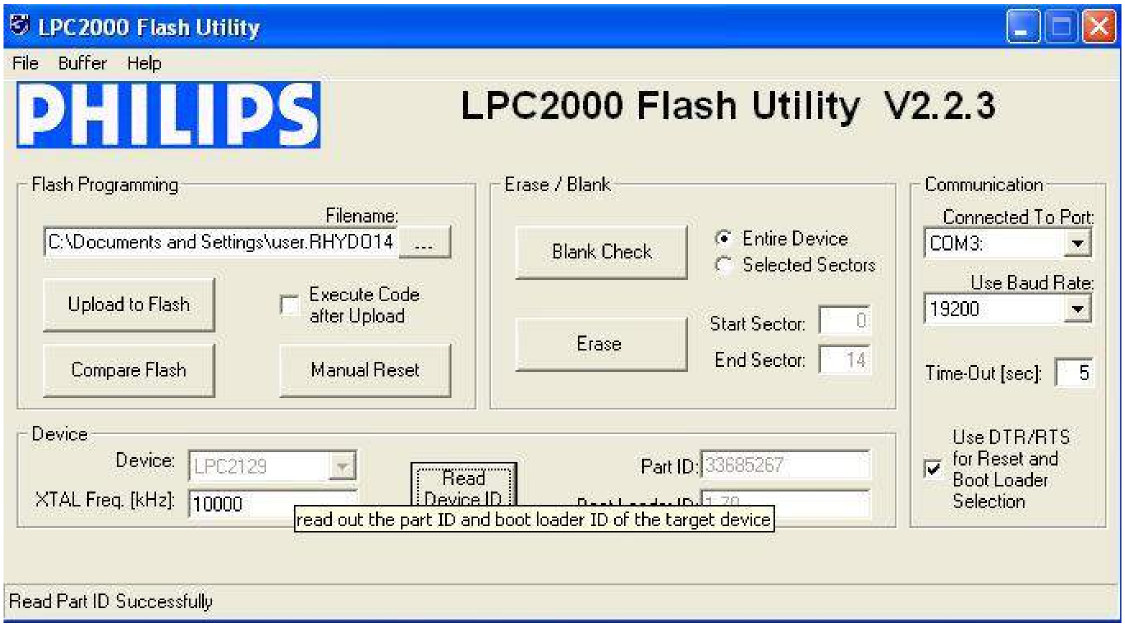


Step 17: Open the desired hex file

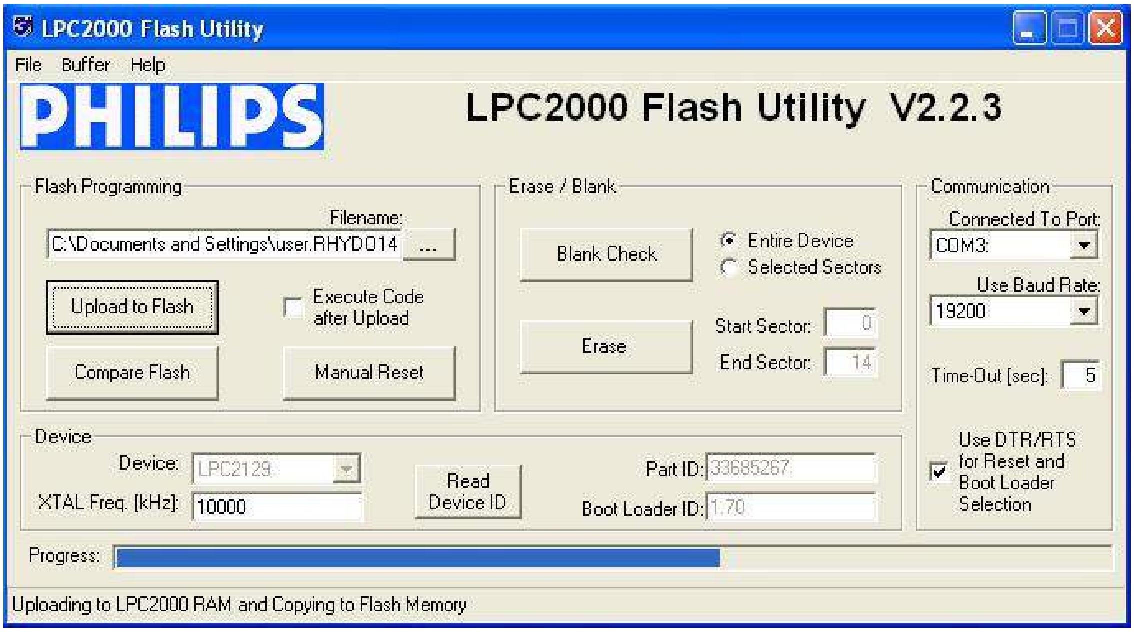


Step 18: Read device ID

If auto mode is selected, simply clicking the ***'Read device ID'*** button will read the ID. But in manual mode, press reset switch and click



Step 19: Click 'Upload to Flash'



After successfully flashing the code into the controller, remove ISP jumper if programmed using manual mode and reset the board. Also ensure that all the necessary jumpers to get the desired output are shorted.

I/O DISTRIBUTION

4.1. PIN DISTRIBUTION OF ARM LPC2129 MINI DEVELOPMENT BOARD

ARM LPC2129	NAME	TYPE	THE I/O ASSIGN OF LPC2129 Development Board
1	P0.21	I/O	PWM5/BUZZER
2	P0.22	I/O	LCD(D1)
3	P0.23	I/O	RD2/CAN RXD
4	P1.19	I/O	LCD(E)/TRACEPKT3
5	P0.24	I/O	TD2/CAN TXD
6	VSS	-	GROUND
7	VDDA	-	3V3
8	P1.18	I/O	LCD(R/W)/TRACEPKT2
9	P0.25	I/O	RD1/(N/C)
10	TD1	I/O	CAN TRANSMITTER OUTPUT
11	P0.27	I/O	AD0.1/(N/C)
12	P1.17	I/O	LCD(RS)/TRACEPKT1
13	P0.28	I/O	AD0.1/TEMPERATURE SENSOR
14	P0.29	I/O	AD0.2/POTENTIOMETER
15	P0.30	I/O	EINT3/AD0.3/(N/C)
16	P1.16	I/O	TRACEPKT0/(N/C)
17	V18	-	1V8
18	VSS	-	GROUND
19	P0.0	I/O	TXD0/PWM1/ZIGBEE/MAX232(T2IN)/ CP2102(RX)
20	P1.31	I/O	TRST/JTAG
21	P0.1	I/O	RXD0/PWM3/ZIGBEE/MAX232(R20UT) / CP2102(TX)
22	P0.2	I/O	SCL0 /(N/C)
23	VDD	-	3V3
24	P1.26	I/O	RTCK/JTAG
25	VSS	-	GROUND
26	P0.3	I/O	SDA0/(N/C)
27	P0.4	I/O	SCK0/AD0.6/(N/C)
28	P1.25	I/O	EXTIN0/(N/C)

29	P0.5	I/O	MISO0/AD0.7/(N/C)
30	P0.6	I/O	MOSI0/(N/C)
31	P0.7	I/O	PWM2/SSEL0/(N/C)
32	P1.24	I/O	SERVO MOTOR/TRACECLK
33	P0.8	I/O	TXD1/PWM4
34	P0.9	I/O	RXD1/PWM6/EINT3
35	P0.10	I/O	RTS1/(N/C)
36	P1.23	I/O	LCD(D7)
37	P0.11	I/O	CTS1/(N/C)
38	P0.12	I/O	DSR1/(N/C)
39	P0.13	I/O	DTR1/(N/C)
40	P1.22	I/O	LCD(D6)
41	P0.14	I/O	DCD1/EINT1/SWITCH SW1/ISP
42	VSS	-	GROUND
43	VDD	-	3V3
44	P1.21	I/O	LCD(D5)
45	P0.15	I/O	R11/EINT2/SWITCH SW2
46	P0.16	I/O	EINT0/SWITCH SW3
47	P0.17	I/O	SCK1/LED1
48	P1.20	I/O	LCD(D4)/TRACESYNC
49	V18	-	1V8
50	VSS	-	GROUND
51	VDD	-	3V3
52	P1.30	I/O	TMS/JTAG
53	P0.18	I/O	MISO1/LED2
54	P0.19	I/O	MOSI1/LED3
55	P0.20	I/O	EINT3/SSEL1/(N/C)
56	P1.29	I/O	TCK/JTAG
57	RESET	-	RESET
58	VSSA-PLL	-	GROUND
59	VSSA	-	GROUND
60	P1.28	I/O	TDI/JTAG
61	XTAL2	-	CRYSTAL
62	XTAL1	-	CRYSTAL
63	V18A	-	1V8
64	P1.27	I/O	TD0/JTAG

TECHNICAL SUPPORT

If you are experiencing a problem that is not described in this manual, please contact us. Our phone lines are open from 9:00 AM – 5.00 PM (Indian Standard Time) Monday through Saturday excluding holidays. Email can be sent to support@rhydolabz.com

DISCLAIMER

Contact Us

Rhydo Technologies (P) Ltd.
(An ISO 9001:2008 Certified R&D Company)
Golden Plaza, Chittoor Road, Cochin – 682018, Kerala, India.
Tel: 0091 484 2370 444, 2371 666, Cell: 0091- 99466 70444
Fax: 0091 484 237 0579, Email: info@rhydolabz.com, sales@rhydolabz.com
For more information please visit: www.rhydolabz.com

rhydoLABZ™