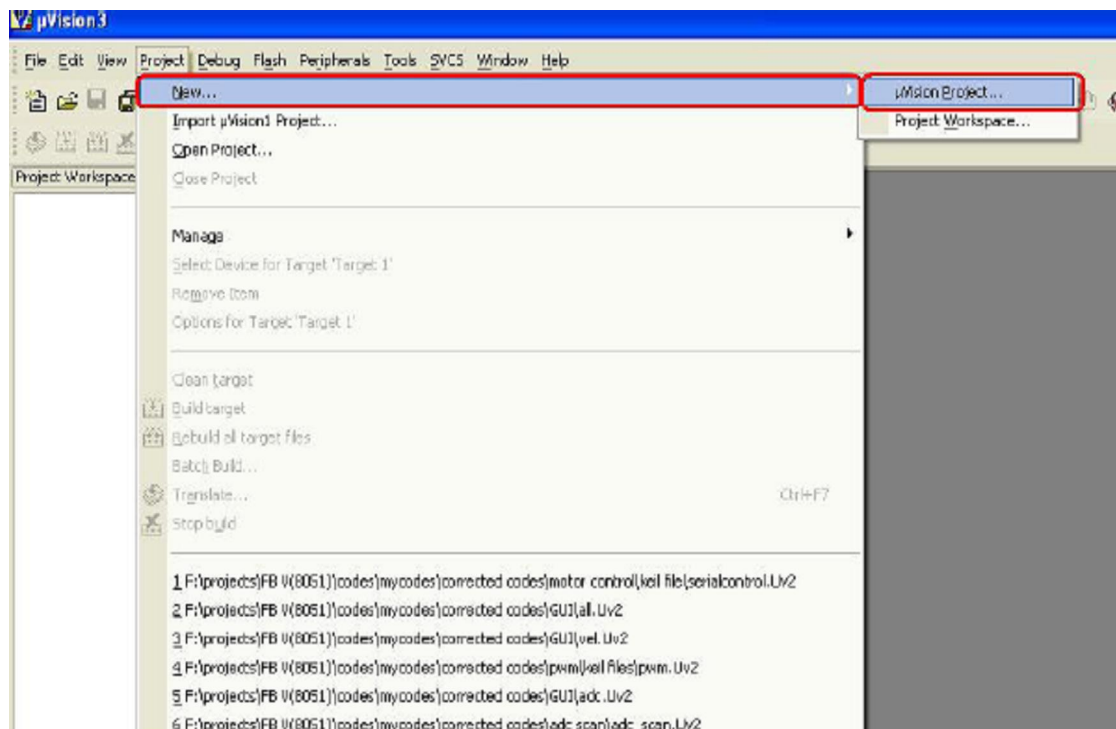


Writing program in KEIL uVision4

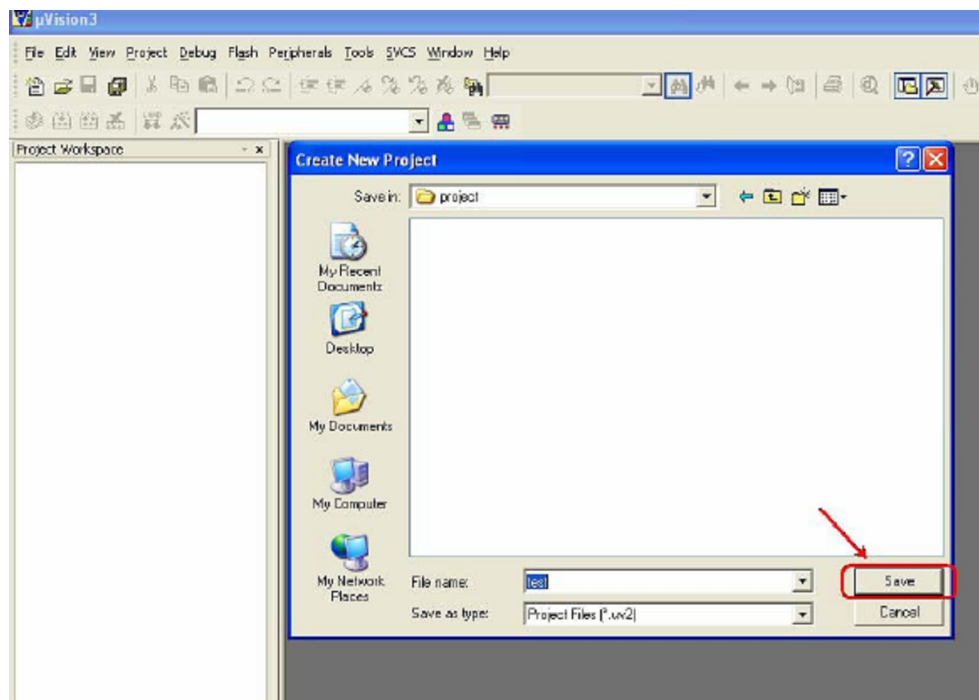
Start with Keil-U-Vision



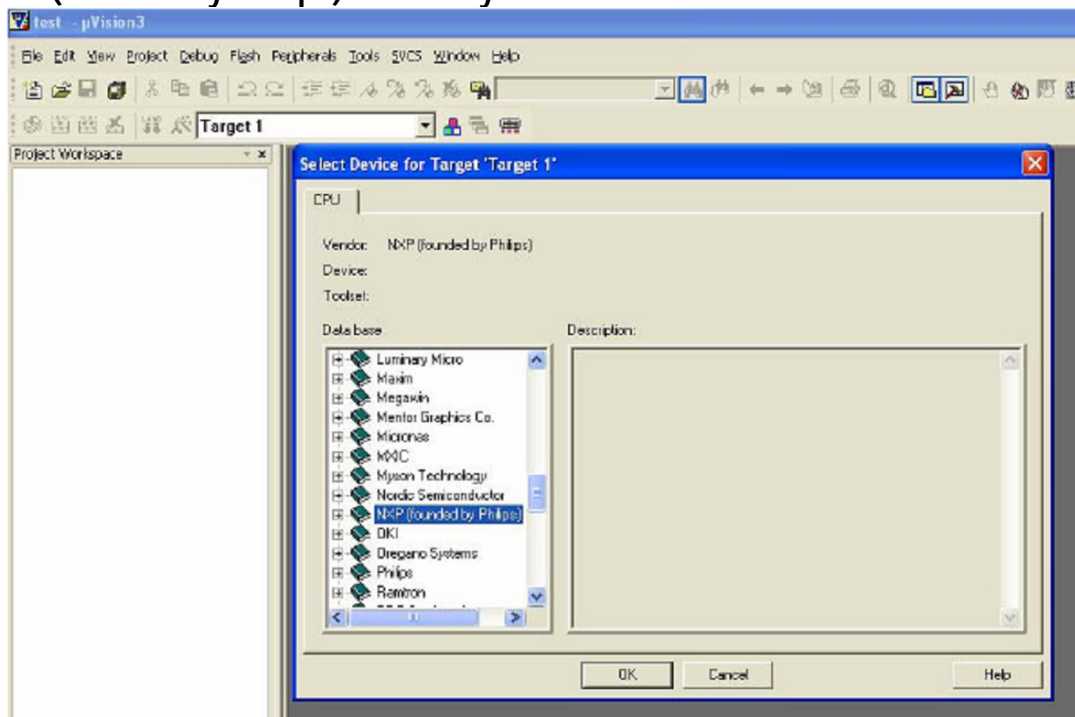
Go to project and start new project.

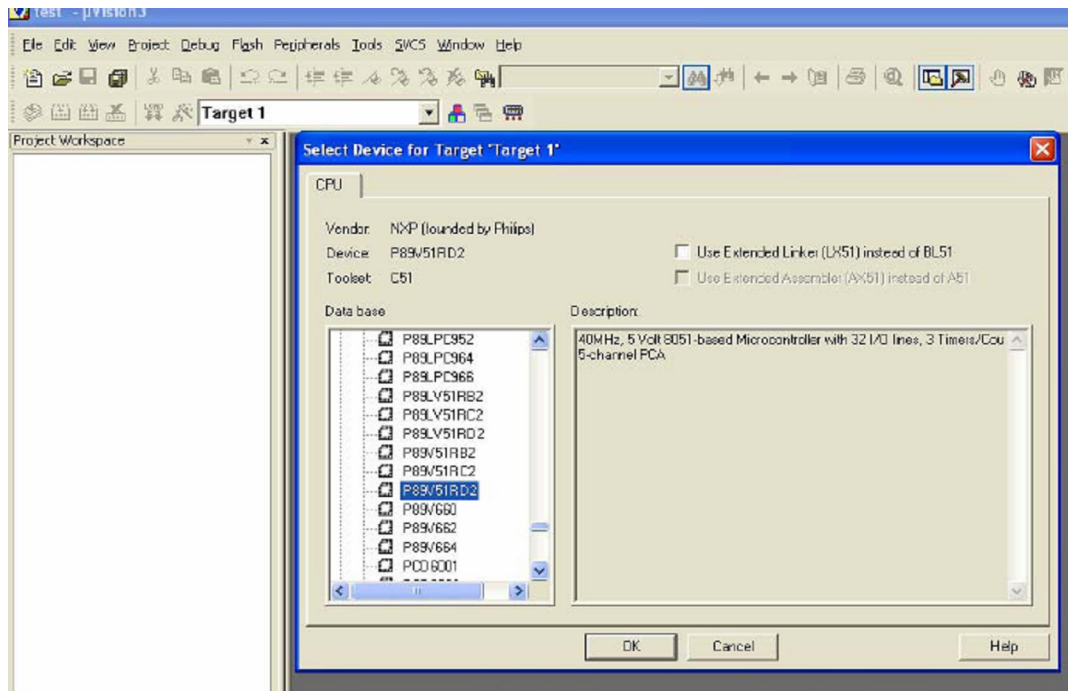


Name your project and save it in your project folder. (always create new folder for new project)



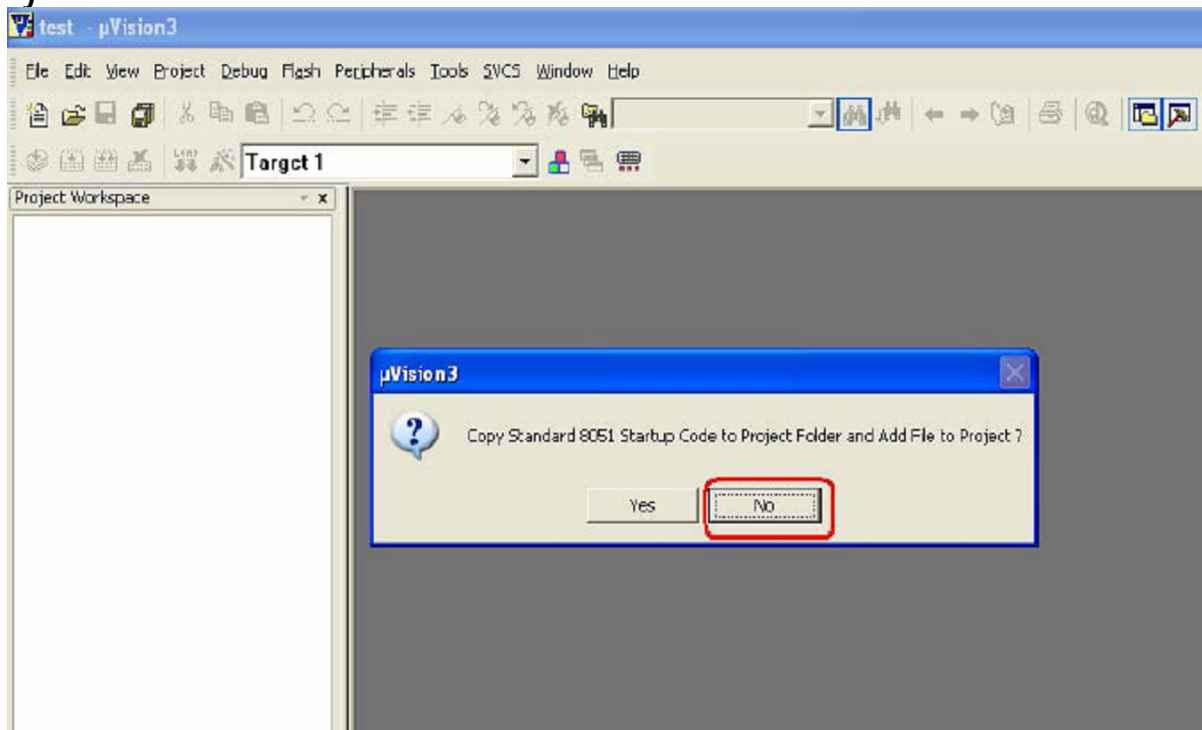
A dialogue box will open asking you to select your device used. Select the appropriate device for e.g. P89V51RD2. Then click OK. P89V51RD2 can be found in the NXP (founded by Philips) directory.





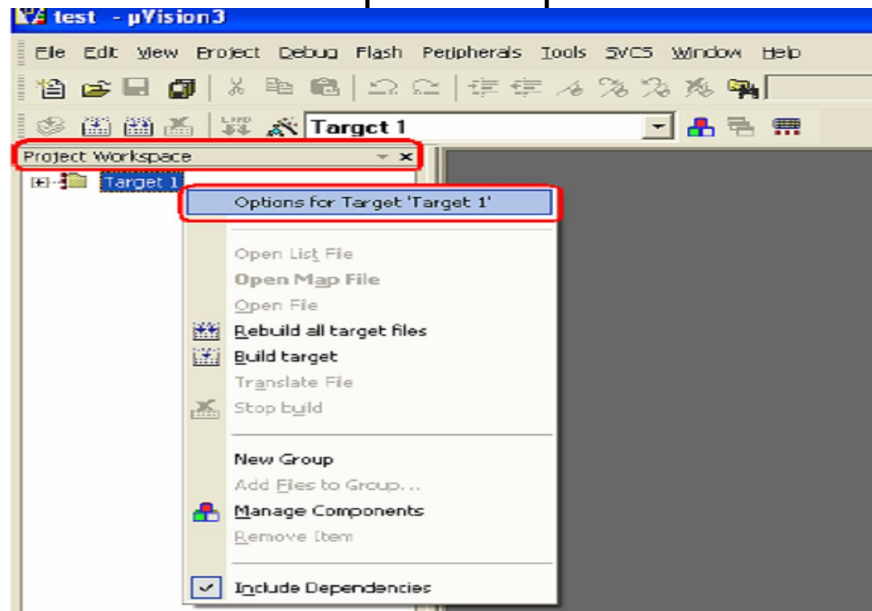
Next it will ask you if you want to add the A51STARTUP code.

Say "NO"

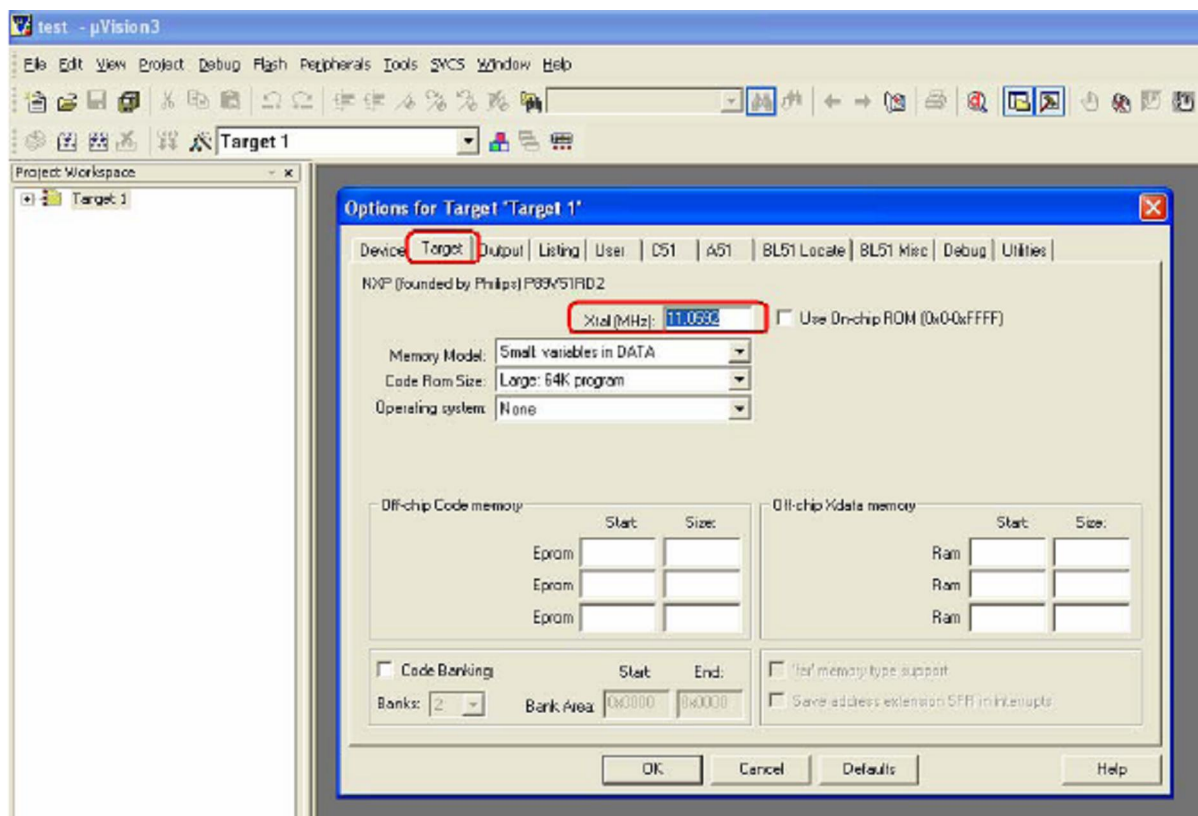


In the Project Workspace right click on 'Target 1' and select options for target as shown.

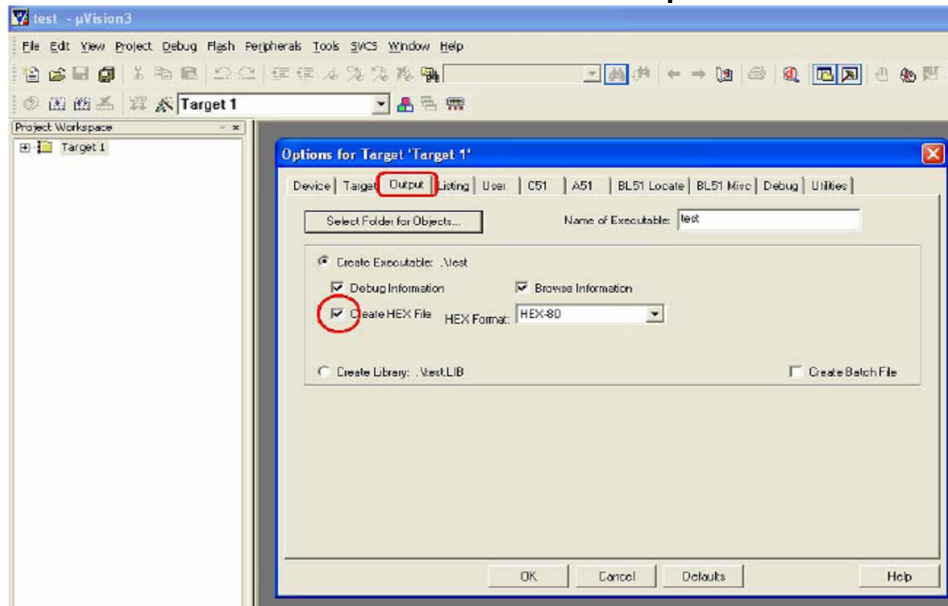
A dialogue box to choose different options will open.



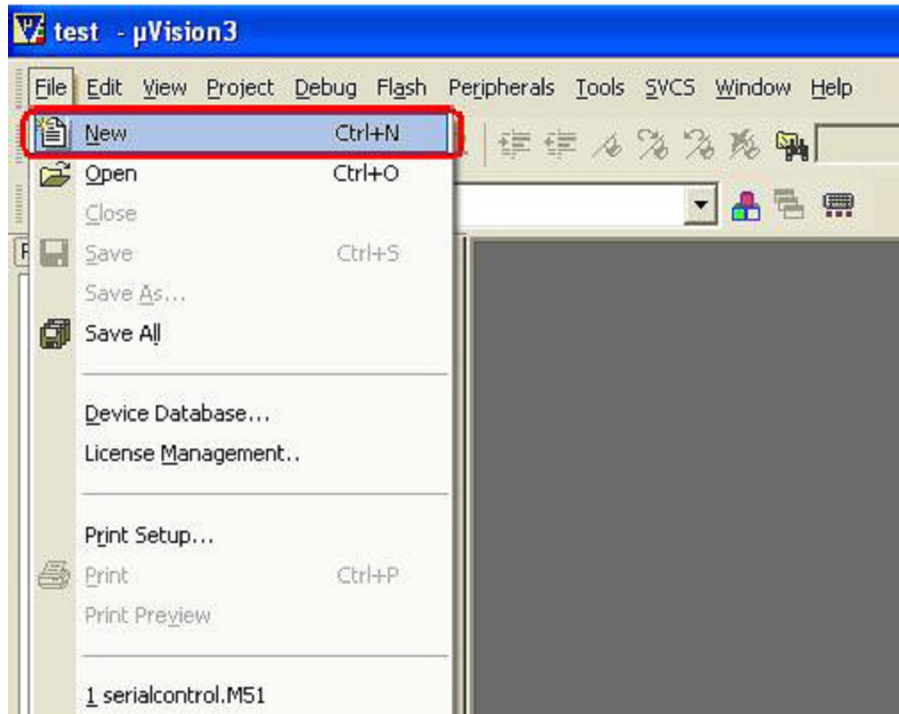
Click on the 'Target' tab. Enter the frequency of the crystal. For Development Board its 11.0592 MHz.



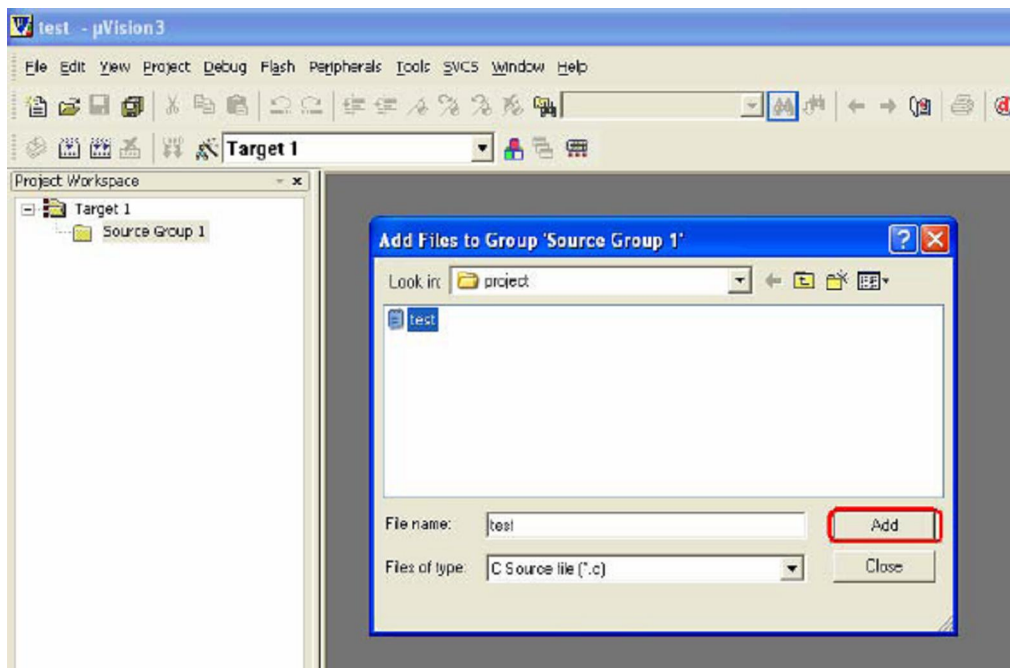
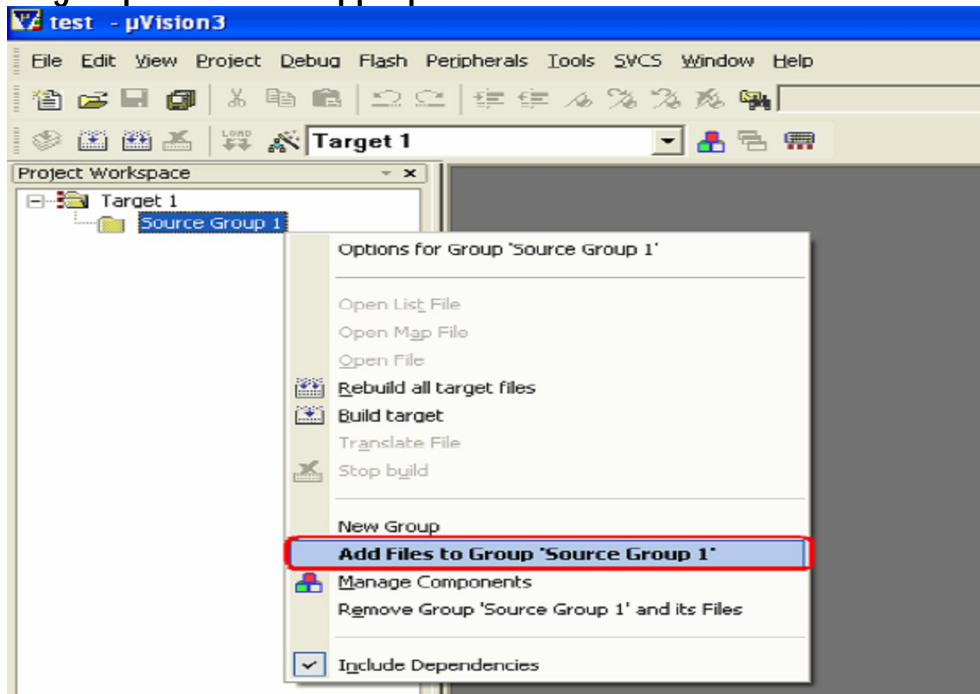
Go to the output tab and tick on the file to create HEX-file. Then click OK to save your options. Other tabs can be left with the default options.



After this is done, open a new file and save it with the project file as a C file i.e. with the extension ".c".



Add this file to the project by Right-clicking on "Source Group" and choosing to add files to group. Select the appropriate '.C' file to be added.



Write your 'C' code and save the file.

Sample Program

```
//code for buzzer beep
//connect Buzzer to Port pin 2.7.

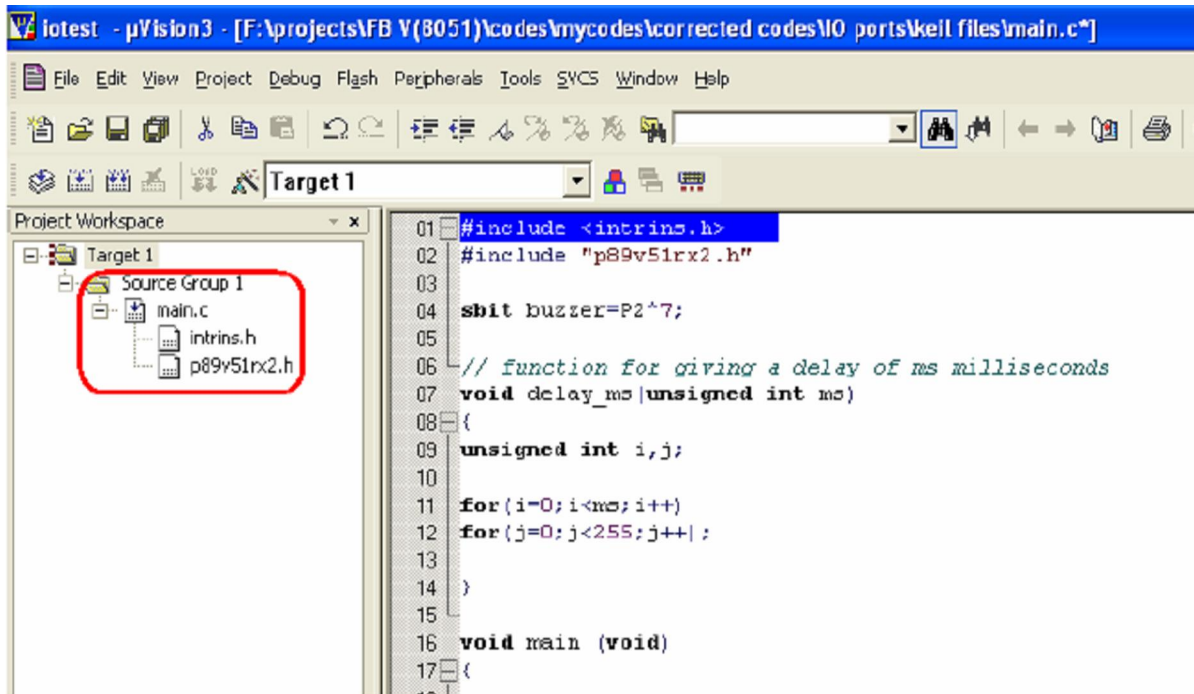
#include <intrins.h>
#include "p89v51rx2.h"

sbit buzzer=P2^7;          //buzzer = 1; buzzer off, buzzer = 0; buzzer on,

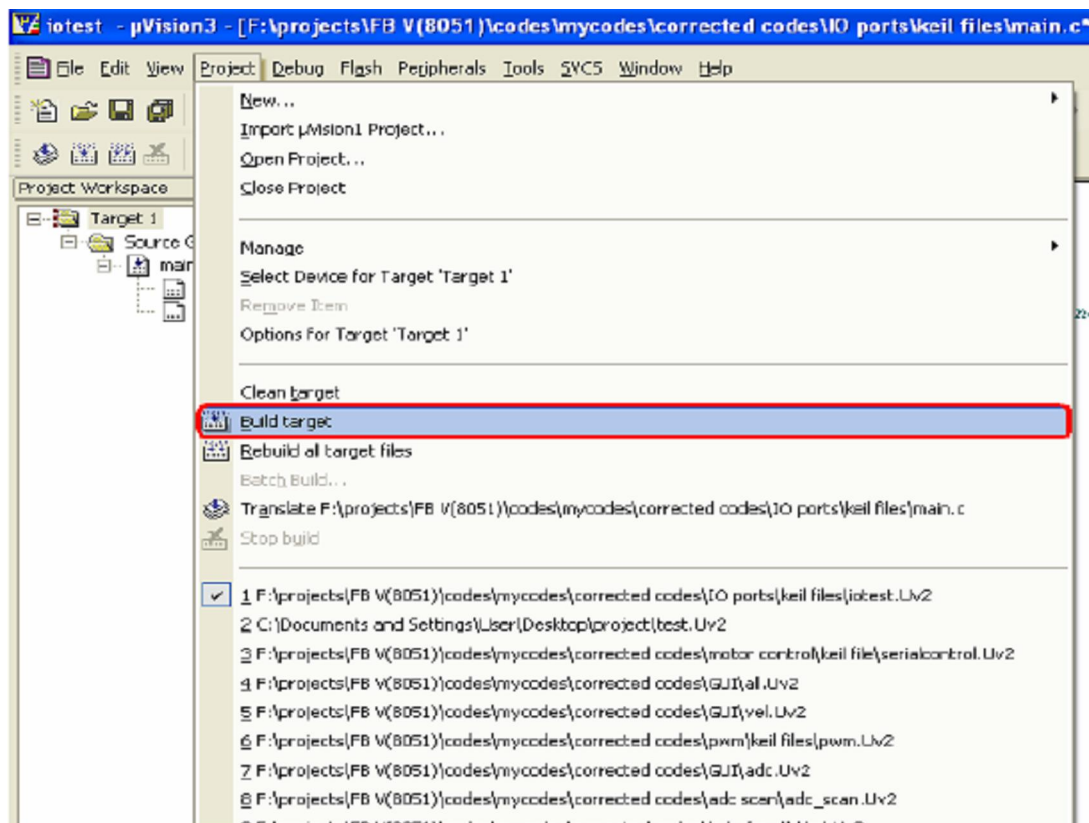
// function for giving a delay of ms milliseconds
void delay_ms(unsigned int ms)
{
  unsigned int i,j;
  for(i=0;i<ms;i++)
  for(j=0;j<53;j++);
}

void main (void)
{
  while(1)
  {
    buzzer=0;          //switch ON the buzzer
    delay_ms(100);    //give delay of 100 milliseconds
    buzzer=1;          //switch off the buzzer
    delay_ms(100);
  }
}
```





Now click on the "Project" tab and choose to "Build Target" as shown.



Check for any errors in the 'Output Window'.

If there are no errors then 'Hex' file will be created and stored in the Project folder. You can then download this file onto your microcontroller using the In System Programming (ISP) software i.e. using flash tools like Flash Magic or FLIP or parallel programming as supported by your microcontroller.

Flash Magic

Version 4.18.1224

Flash Magic is Windows software which allows easy access to all the In System Programming (ISP) features provided by the devices.

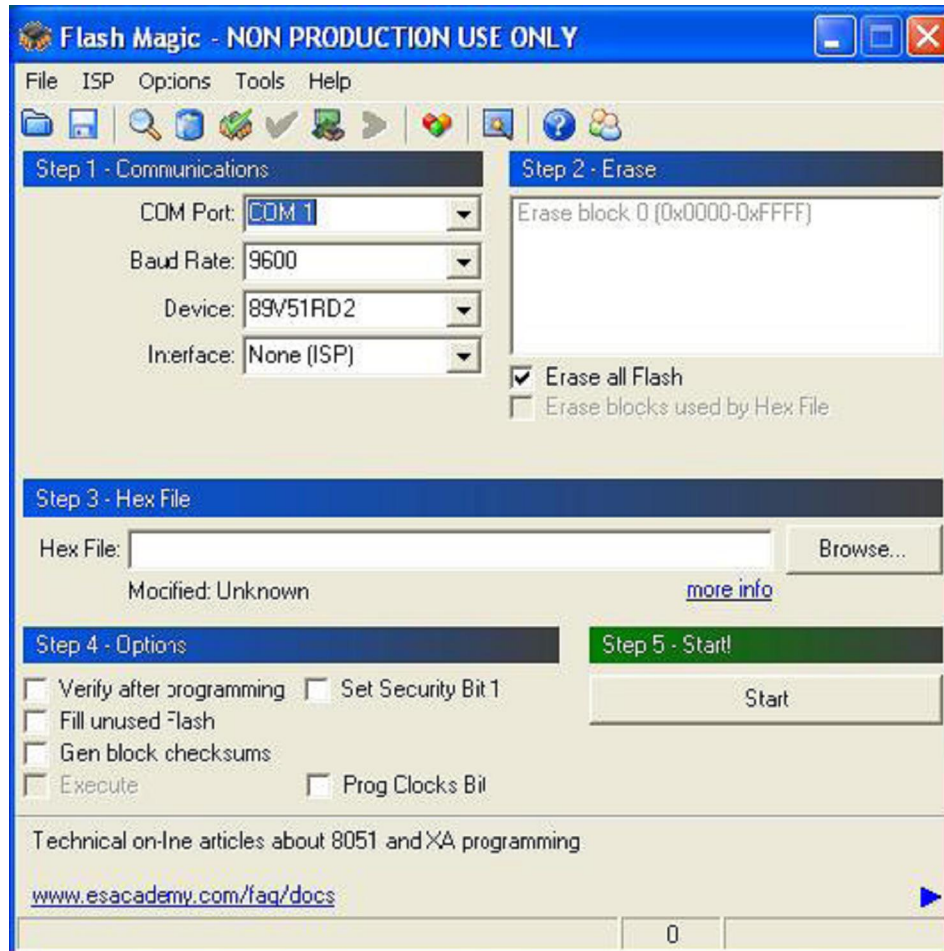
These features include:

- Erasing the Flash memory (individual blocks or the whole device)
- Programming the Flash memory
- Reading Flash memory
- Reading the signature bytes
- Reading and writing the security bits
- Direct load of a new baud rate (high speed communications)
- Sending commands to place device in Boot loader mode

Flash Magic provides a clear and simple user interface to these features

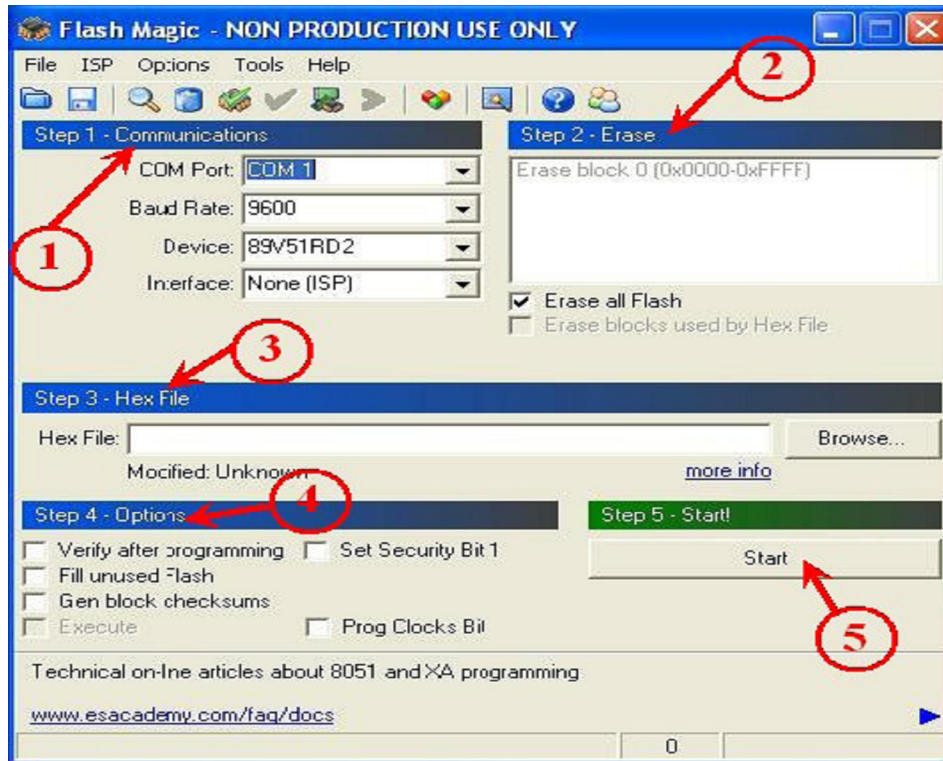


Go to 'Flash Magic' icon, it will open the main window as show below.

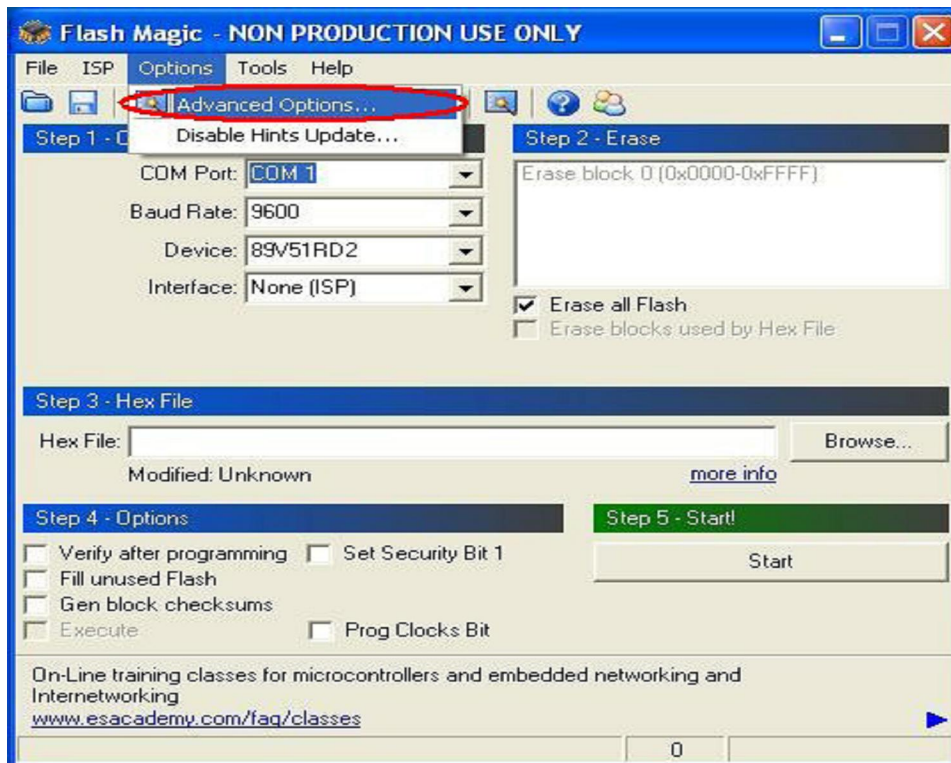


In main window you can see five types of sections.

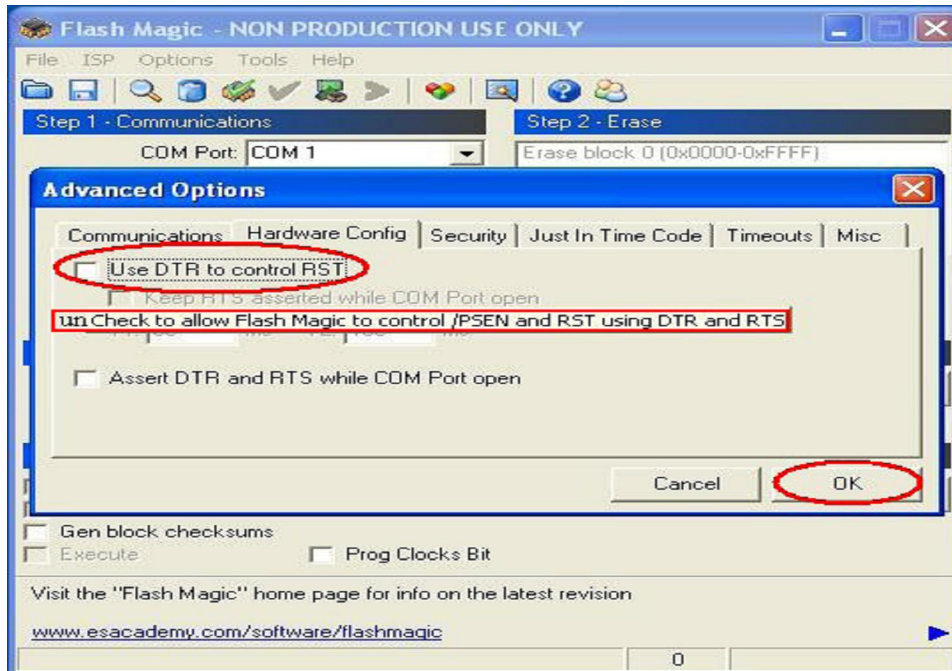
1. Communications
2. Erase
3. Hex File
4. Options
5. Start



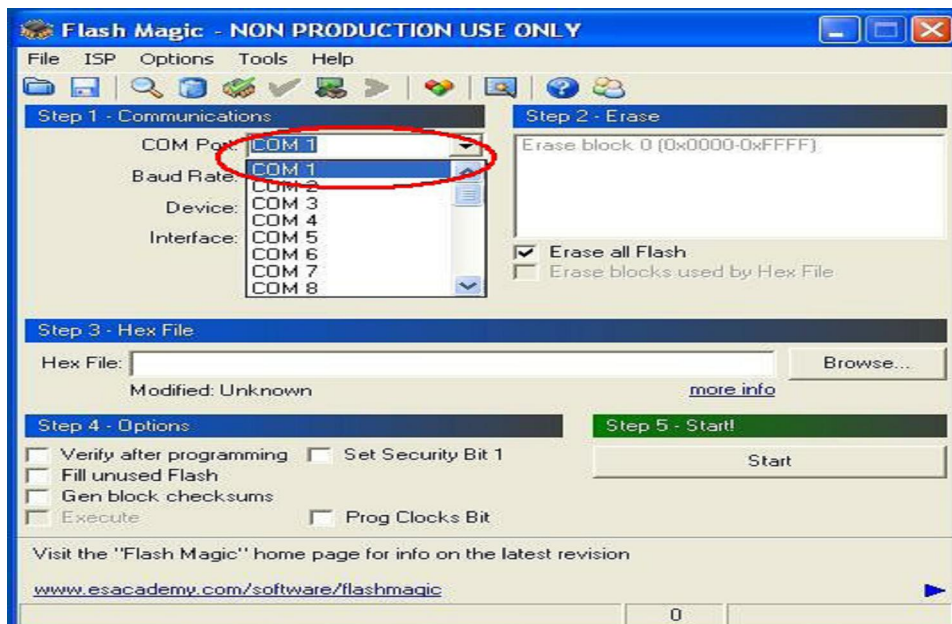
Go to "Option" in the toolbar, and select first menu 'Advance options.'



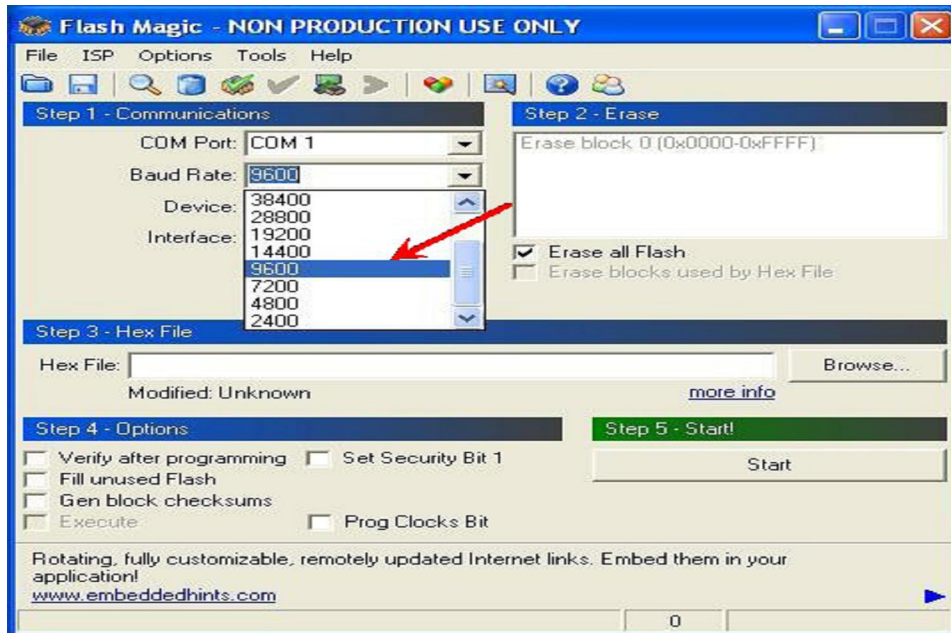
It will show you extracted window with many options.



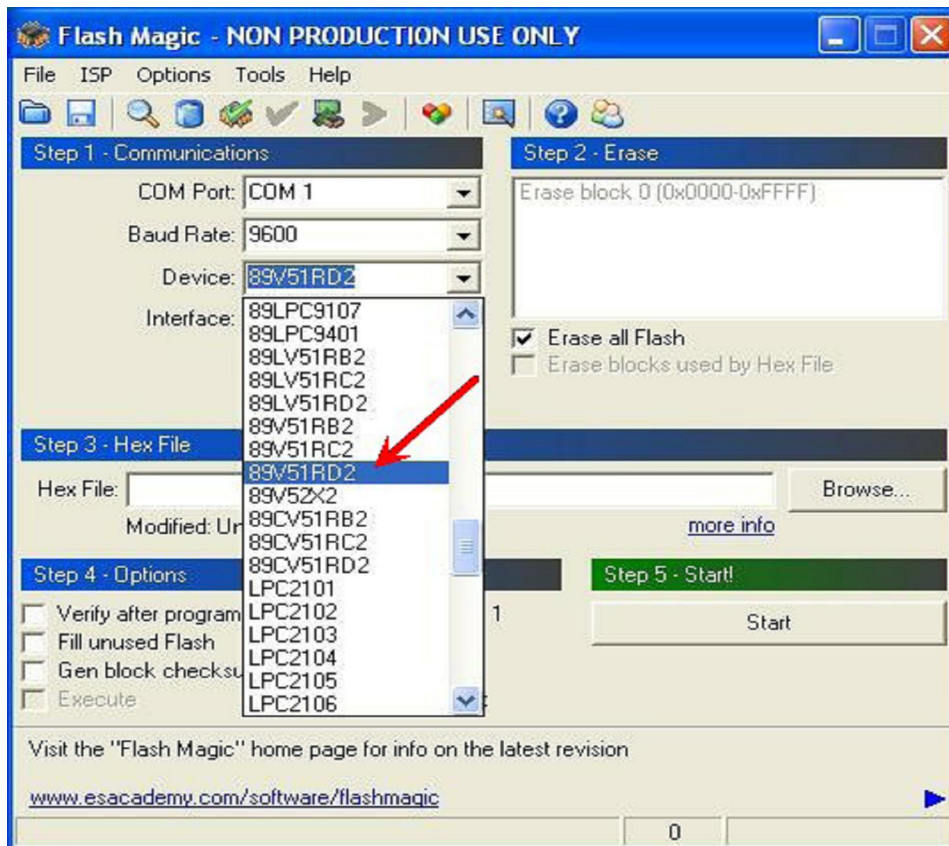
Uncheck the box which is highlighted to don't allow Flash Magic to control PSEN & RST using DTR & RTS. Now go for Communication selection, select '**COM 1**' from '**COM PORT**' Option if you are using serial port. If you are using USB to serial converter then find out COM port number with the help of documentation provided with the USB to serial converter.



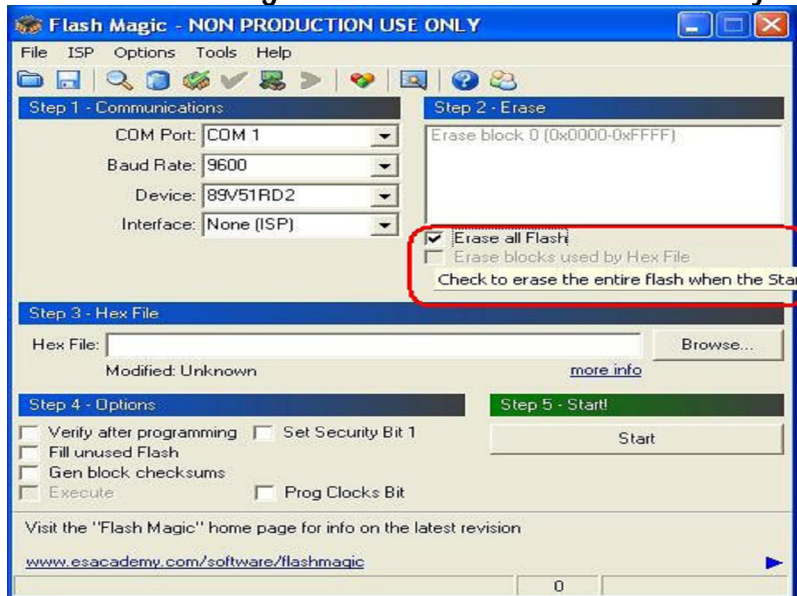
Select '**Baud Rate**' 9600 from Baud Rate option.



Select proper Device '**89V51RD2**' from Device option.

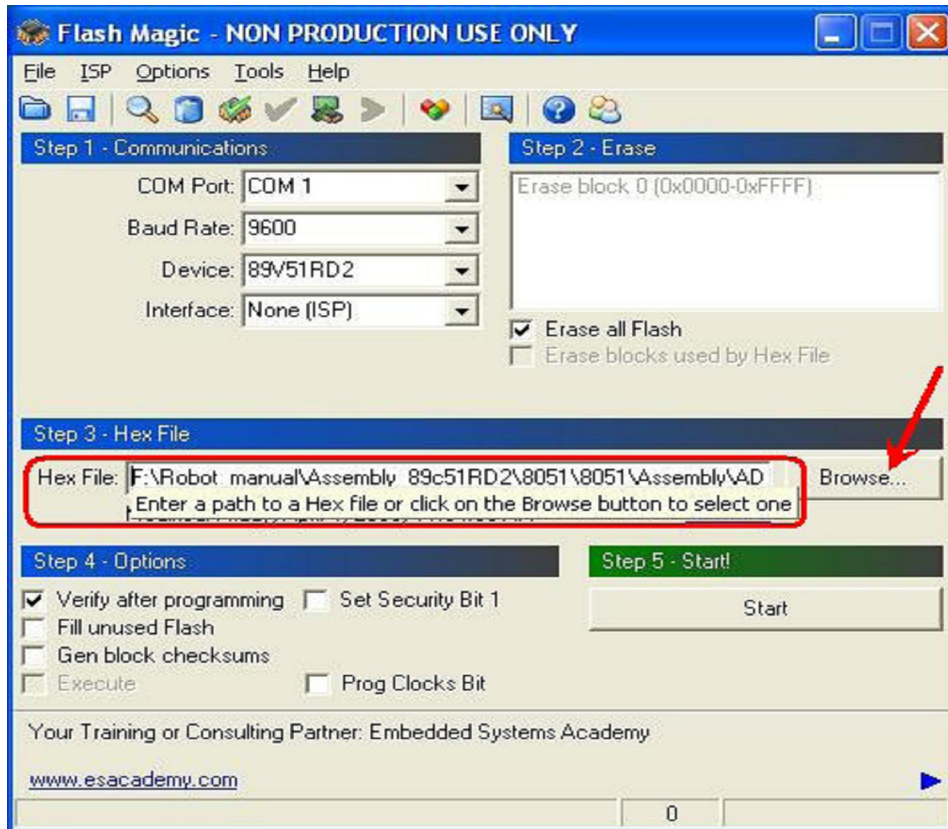


Go to 'Erase' section for erasing the all 'Flash' or Blocks used by 'HEX File'.

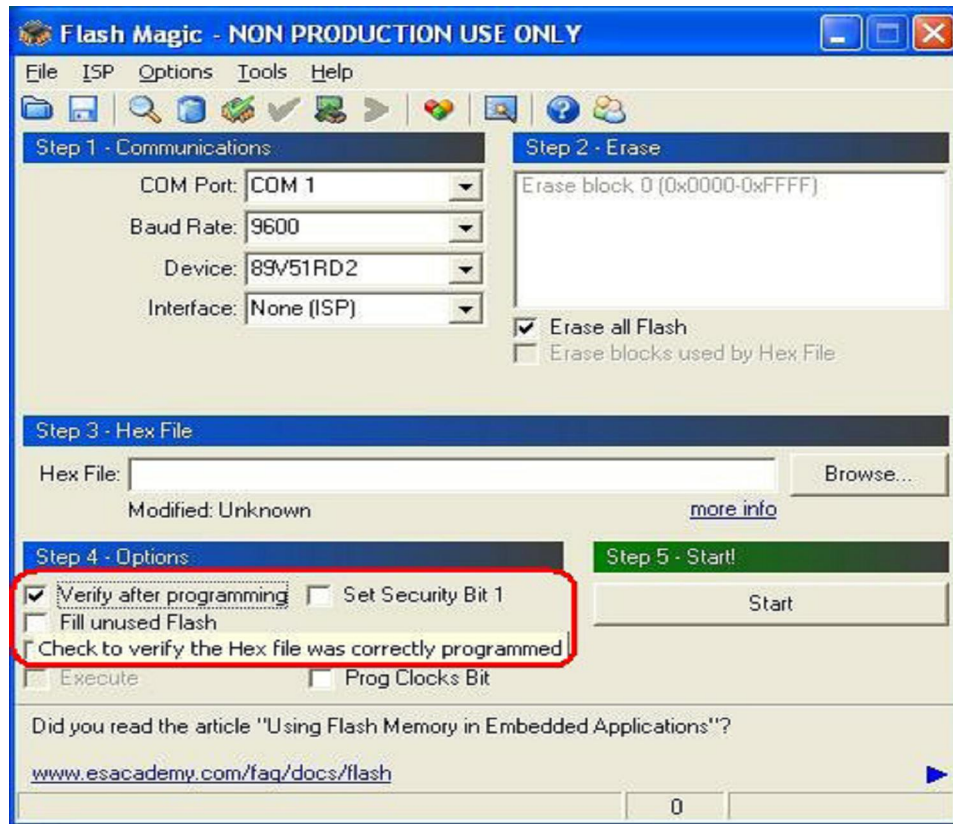


Check on the check box to Erase all Flash.

Go to 'HEX File' section click 'Browse' to select proper Hex file.



Go to 'Option' section to select 'Verify after programming' option. This will verify hex file after loading.



After doing all the required settings, connect serial cable between Controller Board and PC. Turn on the Board and click on the **Start**, it will ask to '**RESET TO DEVICE IN TO ISP MODE**', now press RESET Switch on the Controller Board, Flash magic will load hex file on the robot and verify it for correctness.