

# Hi-Tronic

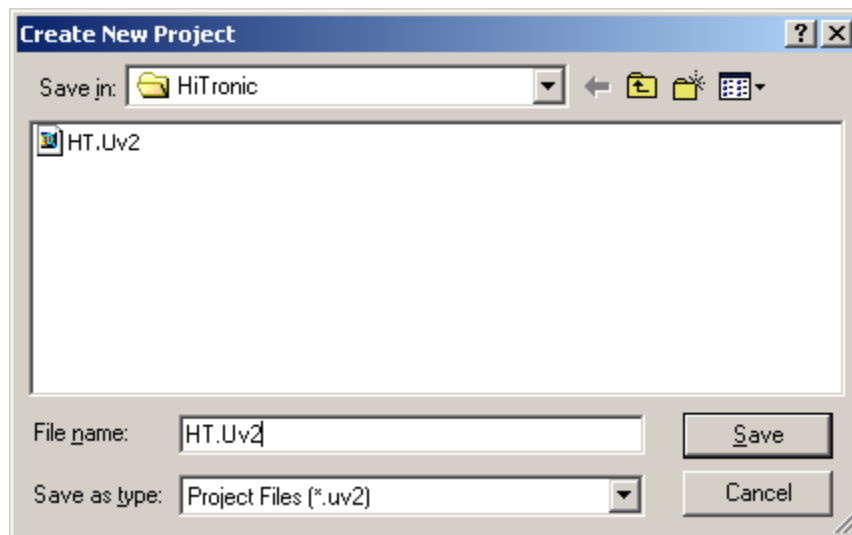
## Keil $\mu$ Vision IDE ASM compile tutorial

August 15, 2005  
Rev. #2

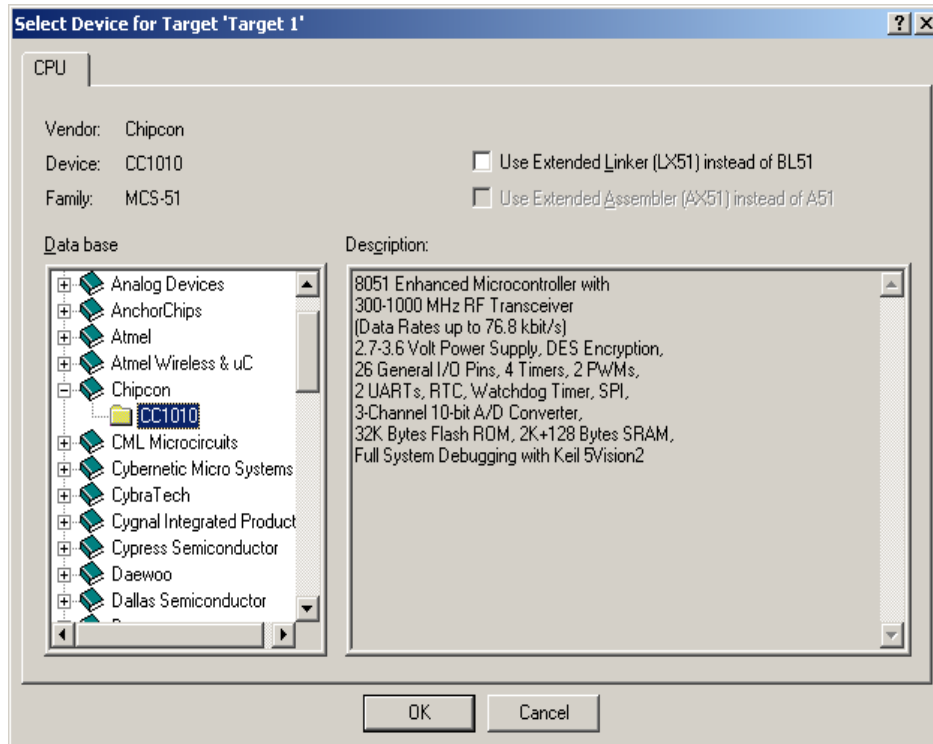
## Hi-Tronic Keil $\mu$ Vision IDE ASM compile tutorial. A How-To Guide.

<http://www.hi-tronic.ca/>

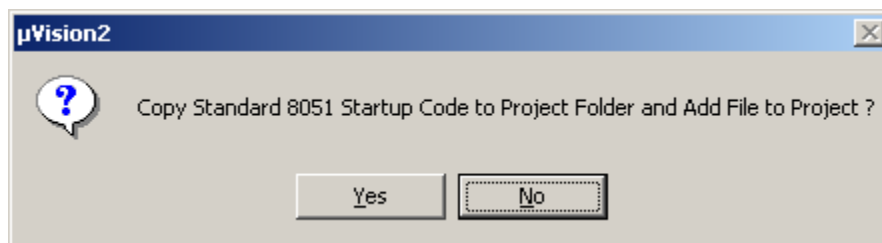
1. To run the IDE, Click Start→Programs→Keil uVision2.
2. Click Project→New Project, and then choose a working directory where you will save all your work. The default path is C:\HiTronic.
3. Name your project. The default name is HT.Uv2. Click on Save to save the file.



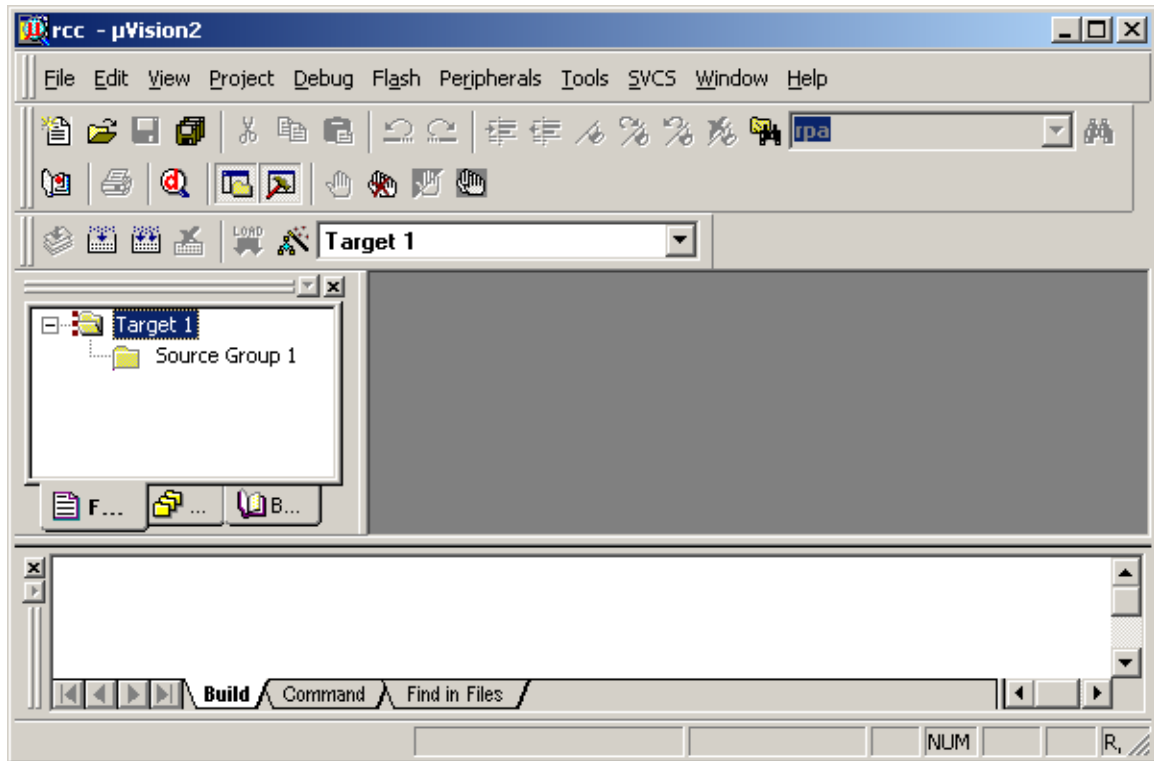
- Once you have clicked on Save, a pop-up window will ask you what chip you would like to use. For example, if you would like to use the CC1010 from Chipcon, you must select Chipcon→CC1010. Ensure that the “Use extended Linker” option is not checked off, and click OK to continue.



- A new pop-up window will appear. It will ask whether you would like to copy the standard 8051 startup code to the project folder. Unless you are an advanced user, you should click No. If you click Yes, you will be faced with code and options too advanced for beginners.

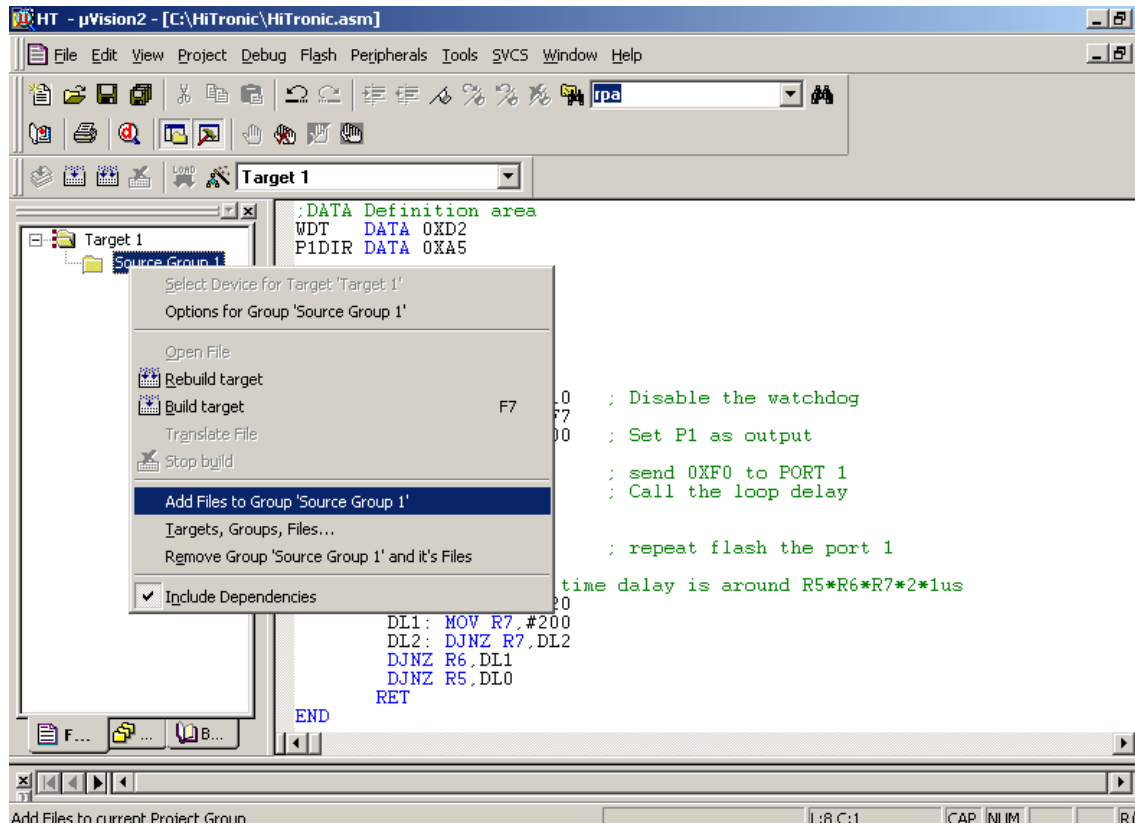


6. You have now created a project, but there is no source code. The program should look like this:

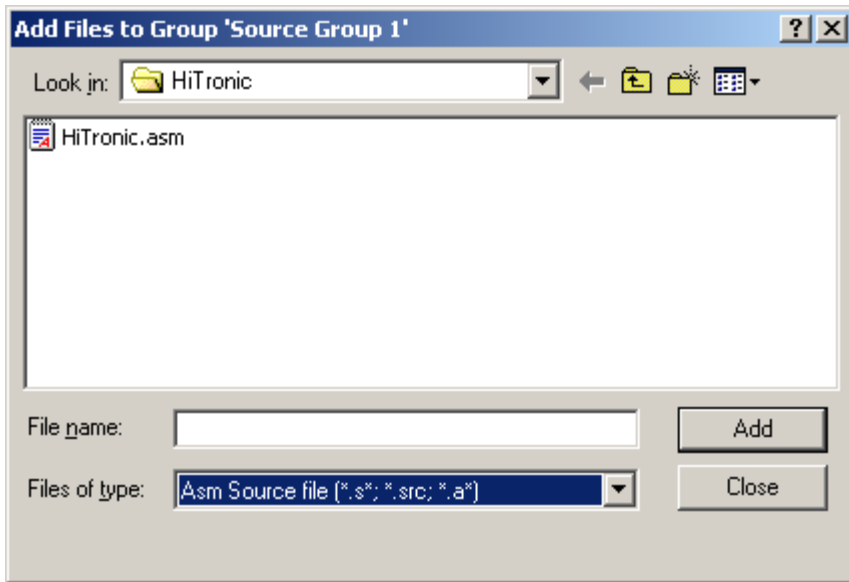


7. To create new source code, go to File→New.
8. Save your work. Go to File→Save As and then name your file. It should have a .asm extension, like HiTronic.asm. You must save your file in the working directory where you have saved your project.
9. You can now enter code into the text editor. To save time, copy the code found in the appendix at end of this document and paste it into the text editor. When you have done so, you will notice that the instructions are in blue, while the comments are in green. Don't worry if you don't understand the code. What's important is that you are learning how to use the tools.

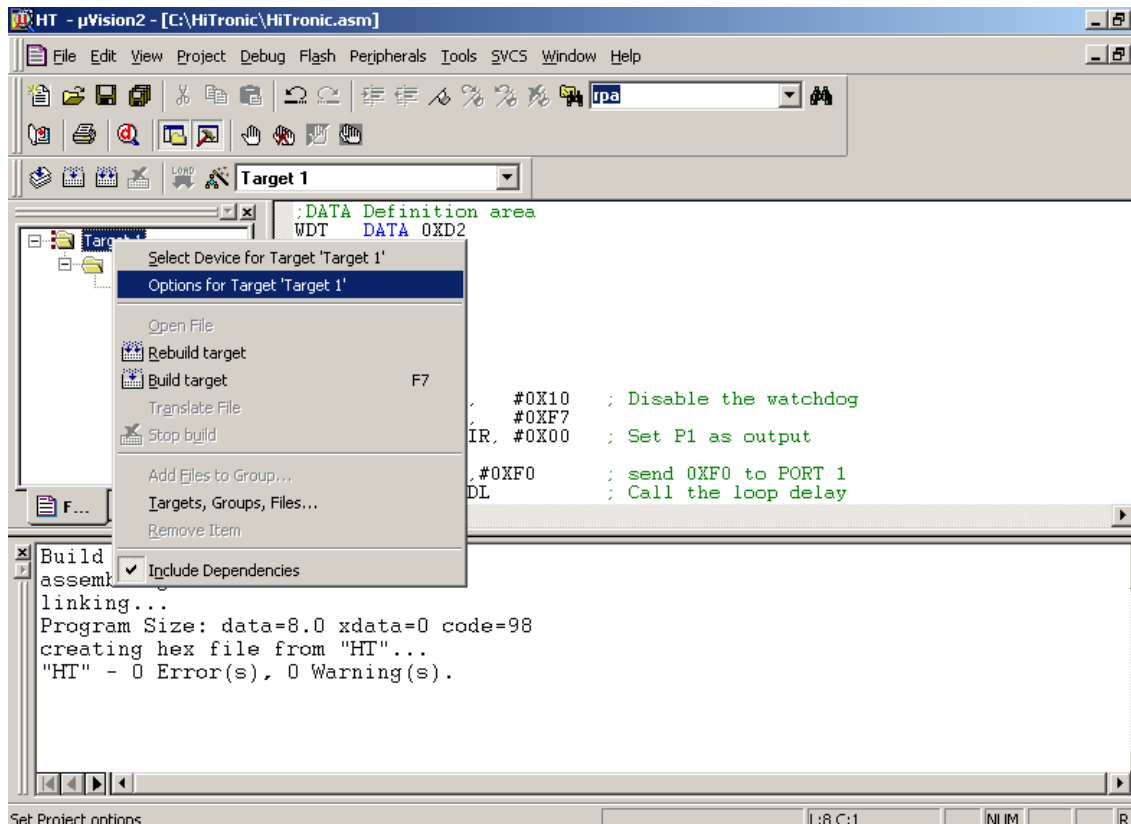
- Now you have source code, but it has not been added to the project. To add the source code to the project, right-click on Source Group 1 and select Add files to Group 'Source Group 1'.



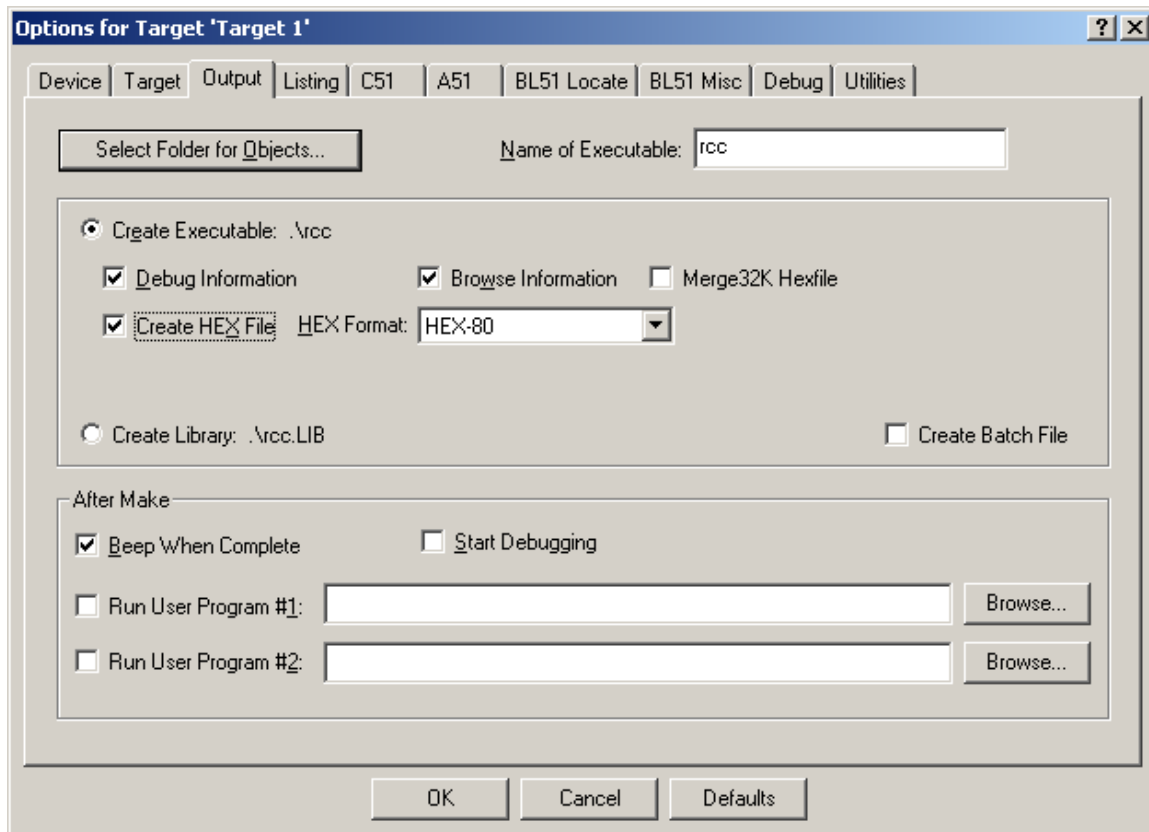
- A pop-up window will appear. Select the file you created. In this example, the file is HiTronic.asm. Click on Add to add the file to the group.



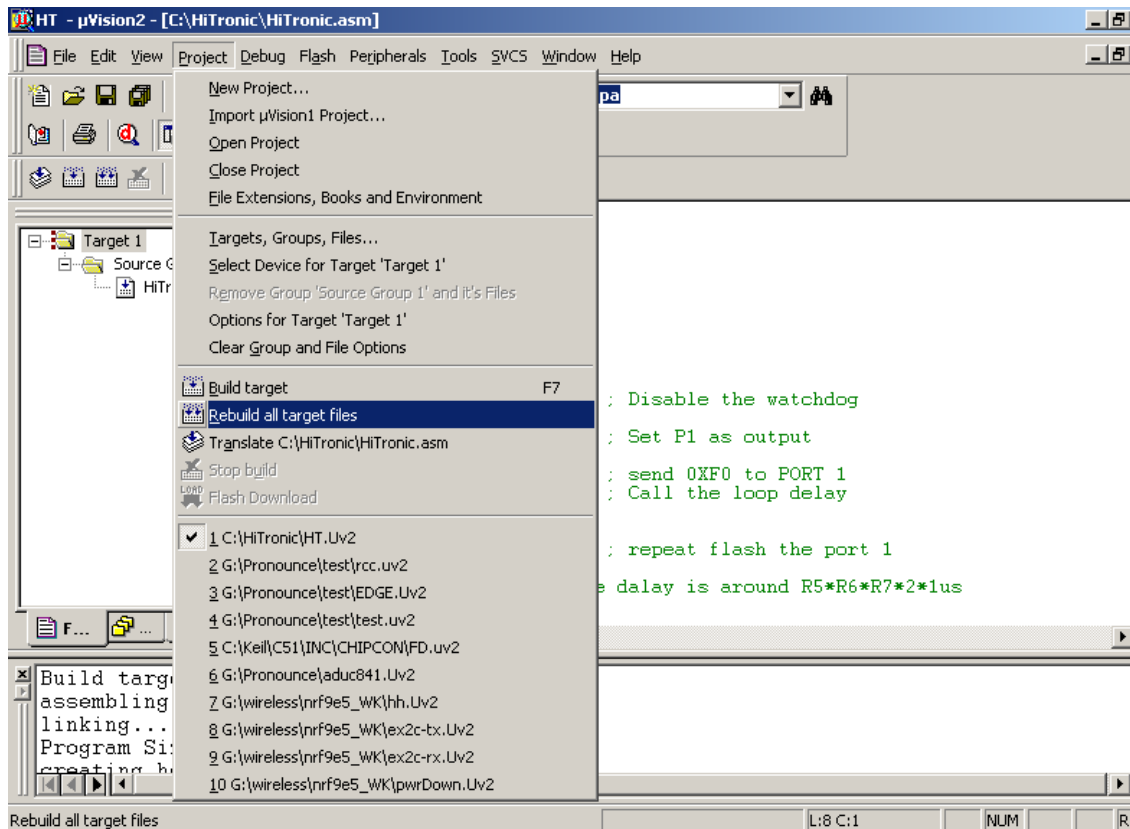
12. Now right-click on Target 1, and select Options for Target 'Target 1'



13. A new window will open. Check Create HEX File to enable the program to create hex files. Click OK to finish.



14. You can now compile the code. Go to Project→Rebuild All Target Files. Your code will be rebuilt and compiled into a HEX file.



15. You are now able to download the .hex file to the hardware by using third-party software like Hi-Tronic's Microcontroller programmer. This software is available for download from the Hi-Tronic website.
16. Go to <http://www.hi-tronic.ca/index.php?site=software> and click on the link for the USB Programmer Software v2.1. Use this program to download the .hex file to your hardware.



**Appendix: HiTronic.asm source code**

```
;DATA Definition area
WDT DATA 0XD2
P1DIR DATA 0XA5

;VECTOR AREA
ORG 00H
SJMP MAIN

;MAIN CODE AREA
ORG 040H
MAIN:
    ORL WDT, #0X10      ; Disable the watchdog
    ANL WDT, #0XF7
    MOV P1DIR, #0X00    ; Set P1 as output

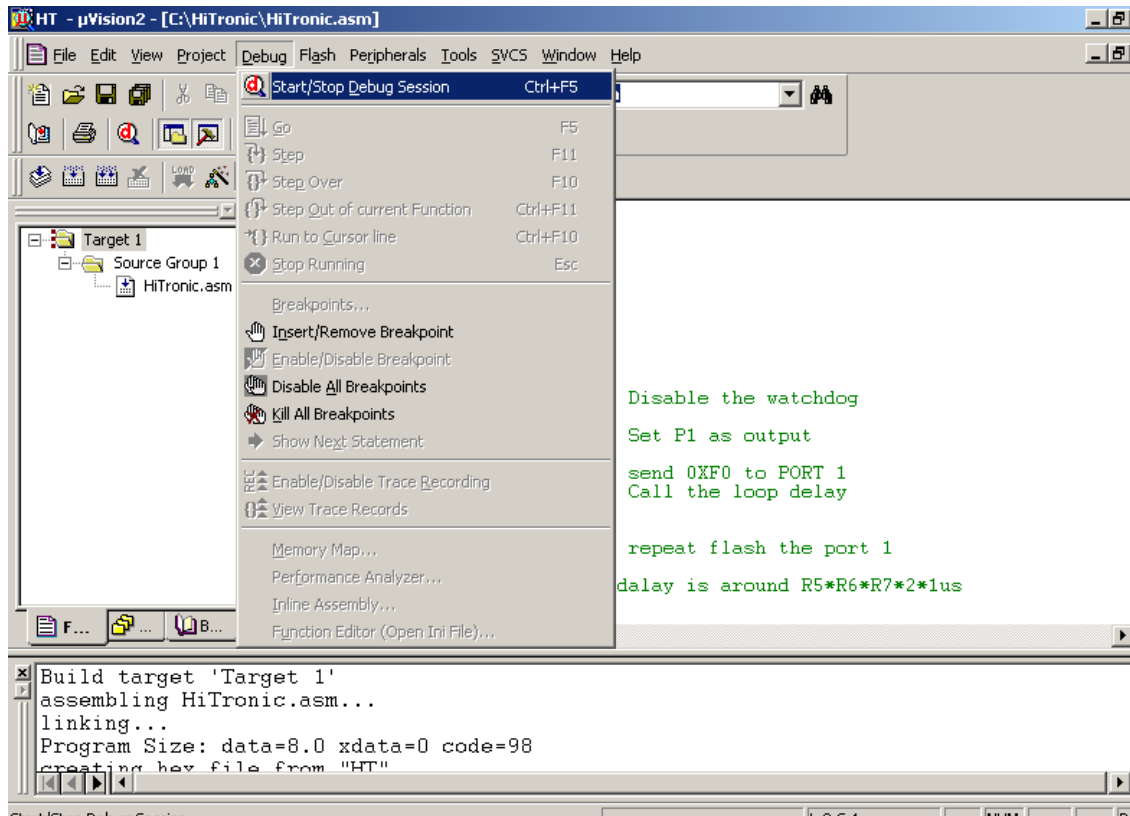
HiTronic:
    MOV P1, #0XF0      ; send 0XF0 to PORT 1
    ACALL DL           ; Call the loop delay
    MOV P1, #0X0F
    ACALL DL
    SJMP HiTronic      ; repeat flash the port 1

DL:    MOV R5, #20      ; time delay is around R5*R6*R7*2*1us
DL0:   MOV R6, #120
DL1:   MOV R7, #200
DL2:   DJNZ R7, DL2
        DJNZ R6, DL1
        DJNZ R5, DL0
        RET

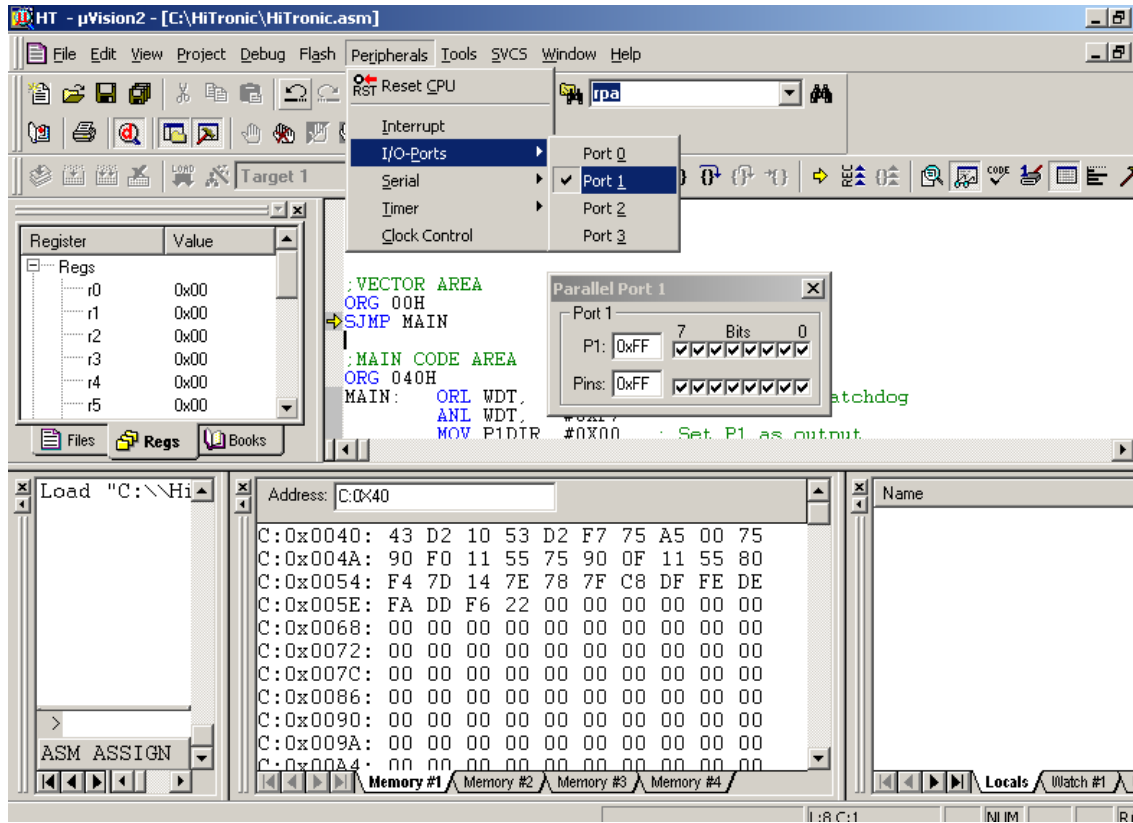
END
```

## How to debug the ASM file.

1. If you want to debug, go to Debug→Start/Stop Debug Session to enable the debug mode.

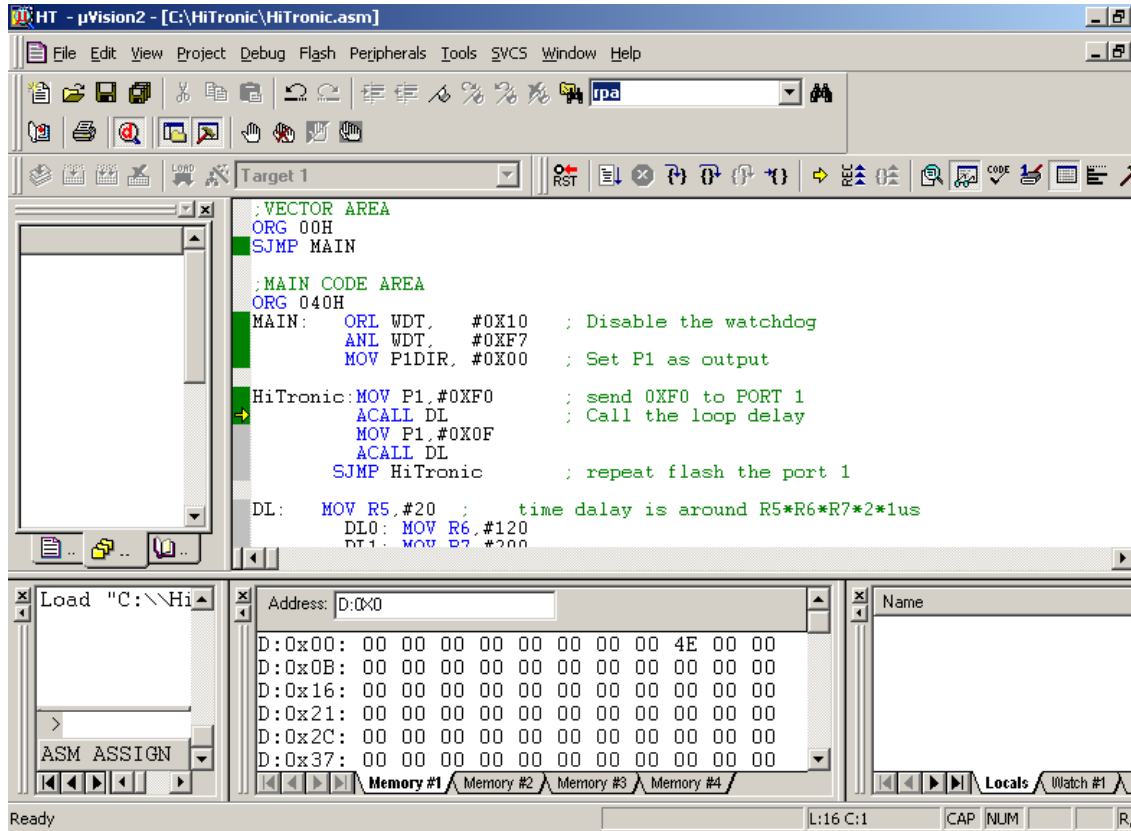


2. Go to Peripherals and select the appropriate IO port.

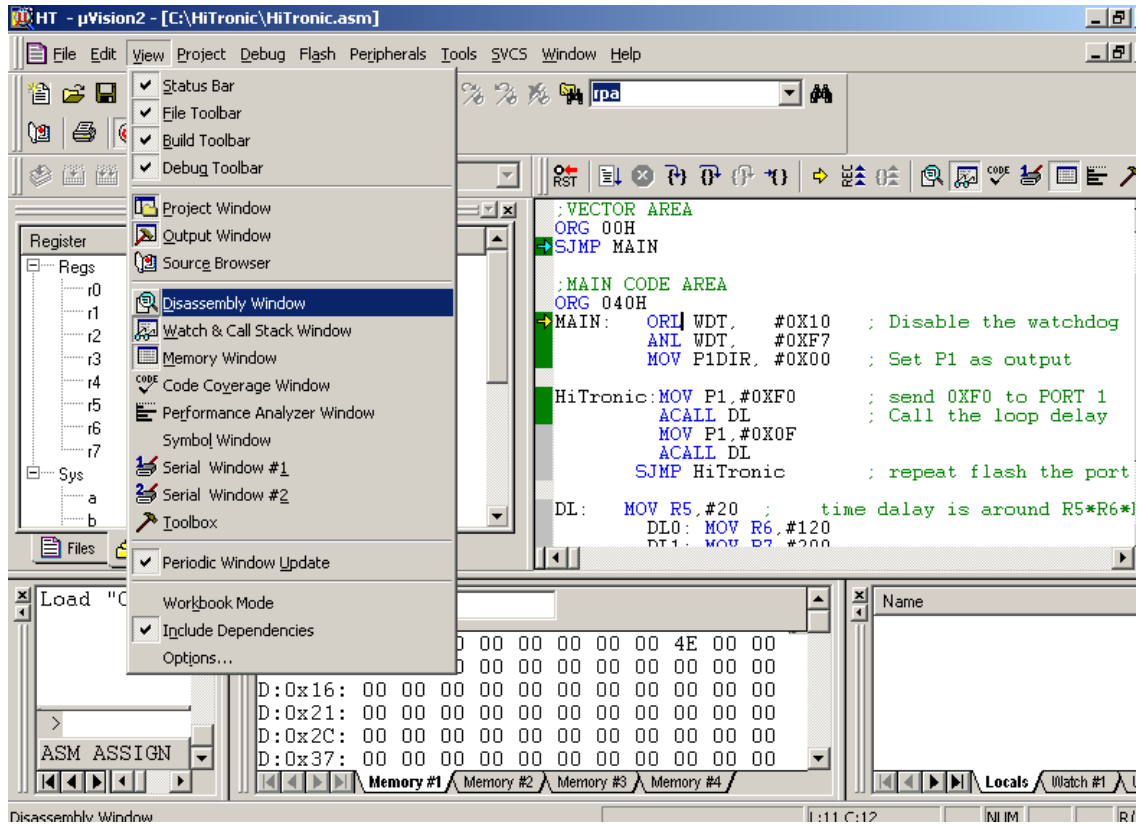




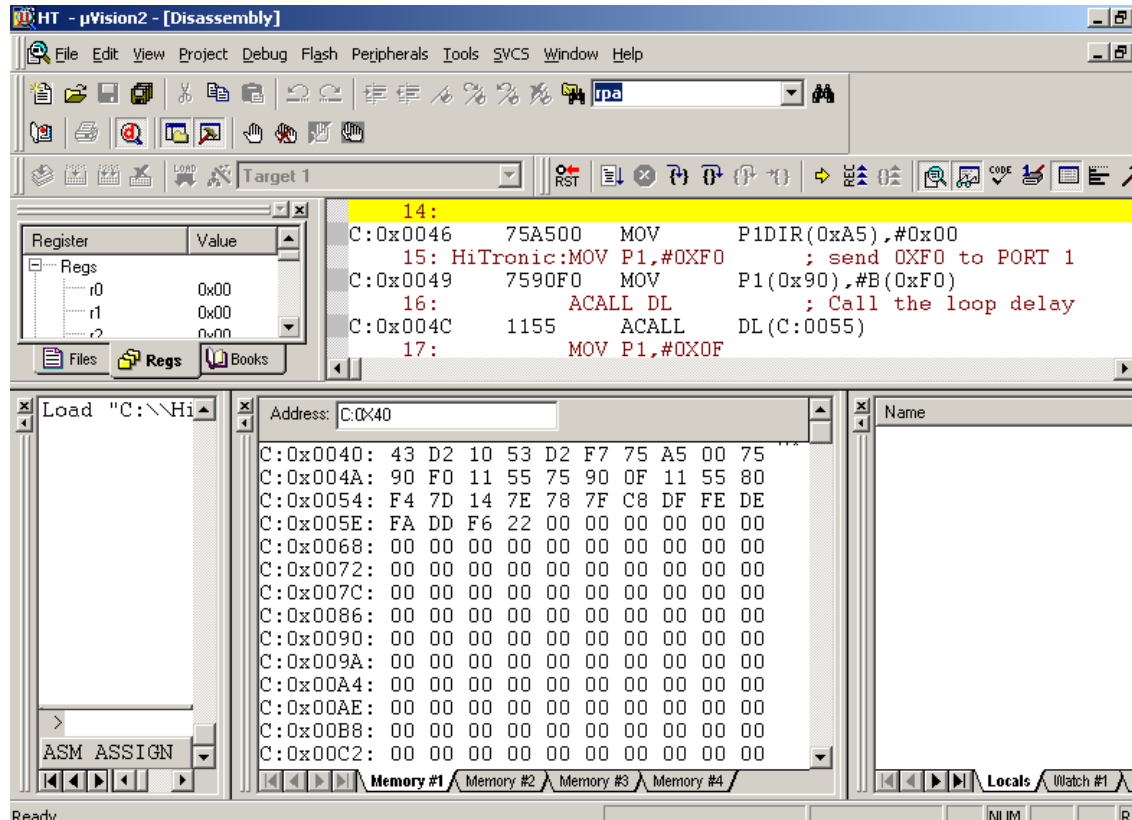
4. Press F11 to continue to step through each line of the program. A small yellow pointer will indicate which instruction will be executed.



5. You do not have to activate the disassembly window to step through the code. However, can view the source code and OP-Code in the same place by going to View→Disassembly Window.



6. Now, press F11 to continue to step through each line of the program. A small yellow pointer will indicate which instruction will be executed. The Op-code is in red.



7. To view the code memory, data memory or external memory, go to View→Memory Window.

To view the **CODE** memory, go to the Address box and type **C:** and the line at which you would like to start. For instance, to begin from 0x40, type **C:0X40**.

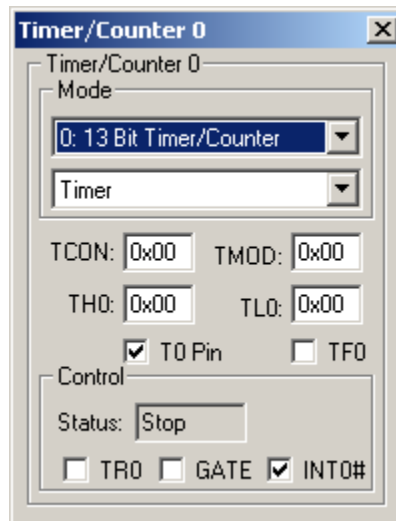
To view the **DATA** memory, go to the Address box and type **D:** and the line at which you would like to start. For instance, to begin from 0x40, type **D:0X40**.

To view the **EXTERNAL** memory, go to the Address box and type **X:** and the line at which you would like to start. For instance, to begin from 0x40, type **X:0X40**.

8. To debug the serial port, go to Peripherals→Serial. You will then see the following pop-up window:

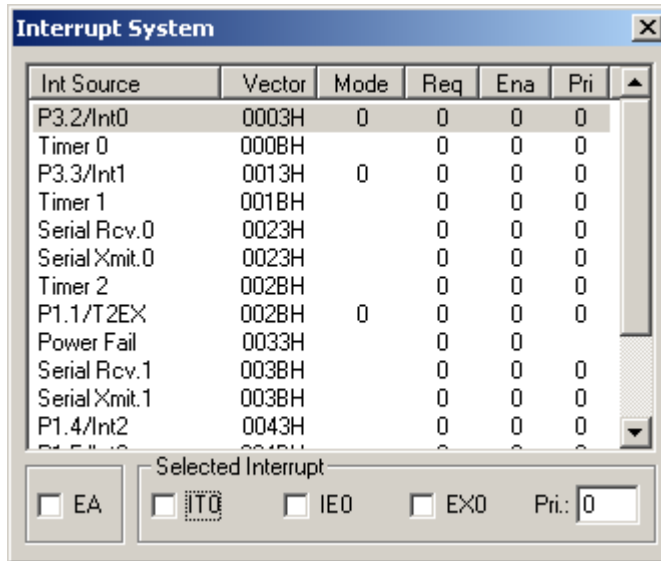


9. To debug the timer, go to Peripherals→Timer. You will then see the following pop-up window:





10. To watch the interrupt table, go to Peripherals→Interrupt. You will then see the following pop-up window:



11. To exit the debug mode, go to Debug→Stop Debug Session.