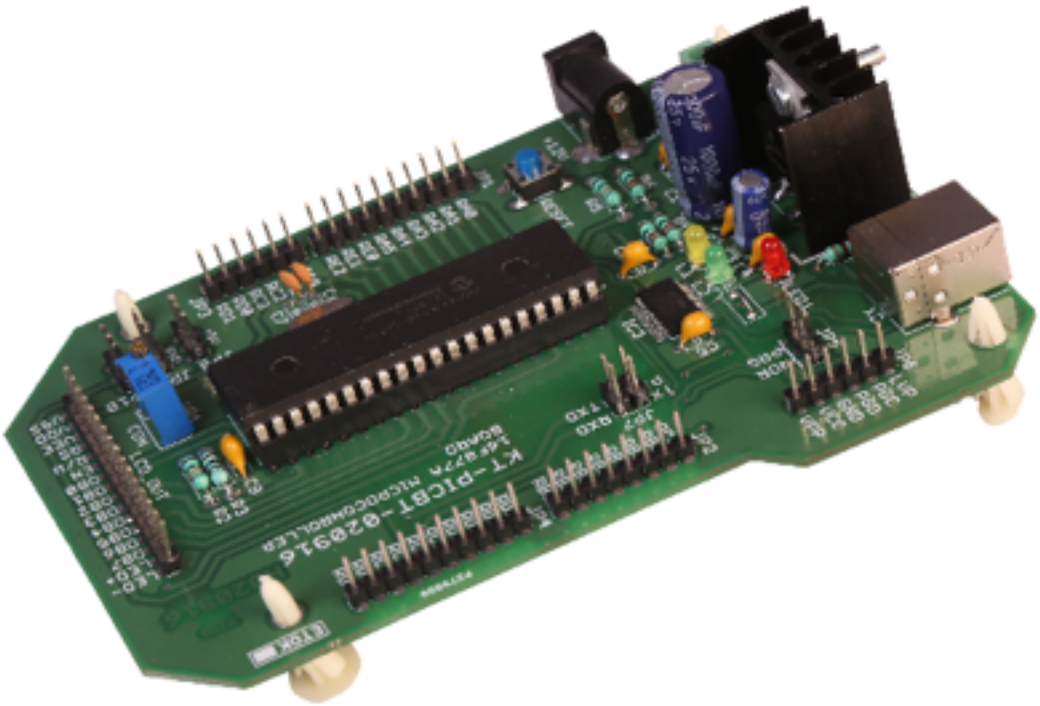
KRISH TEC

KT-PICBT-020916

USER INSTRUCTOR



KRISH TEC

(EQUAL OPPORTUNITY FOR EXCELLENCE)

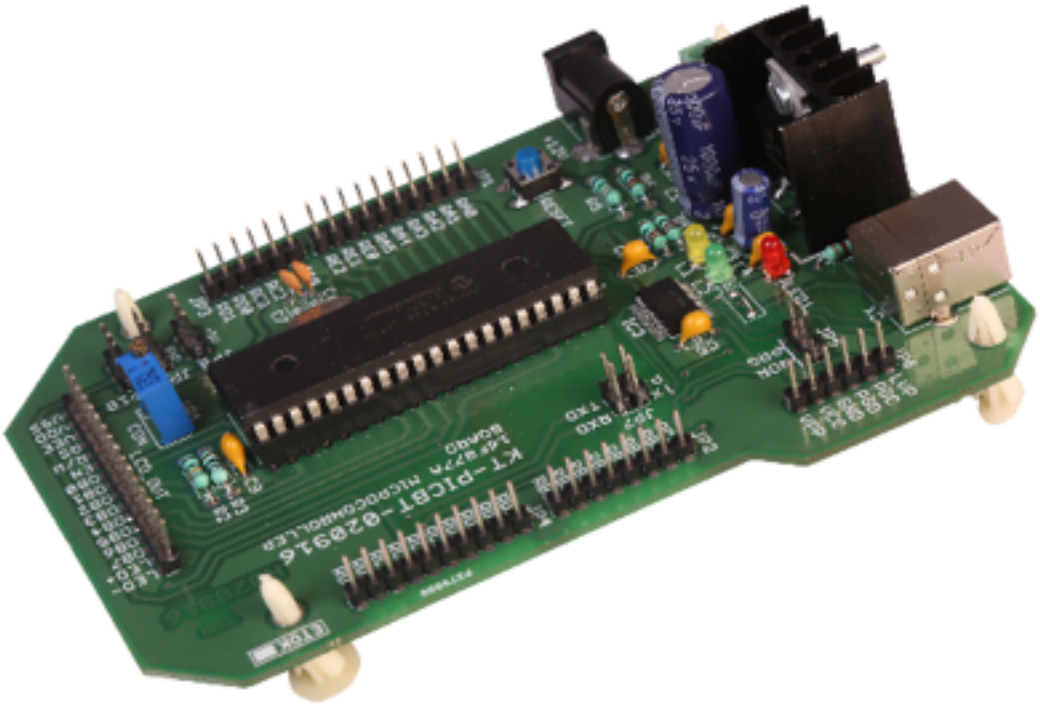


Table of Contents

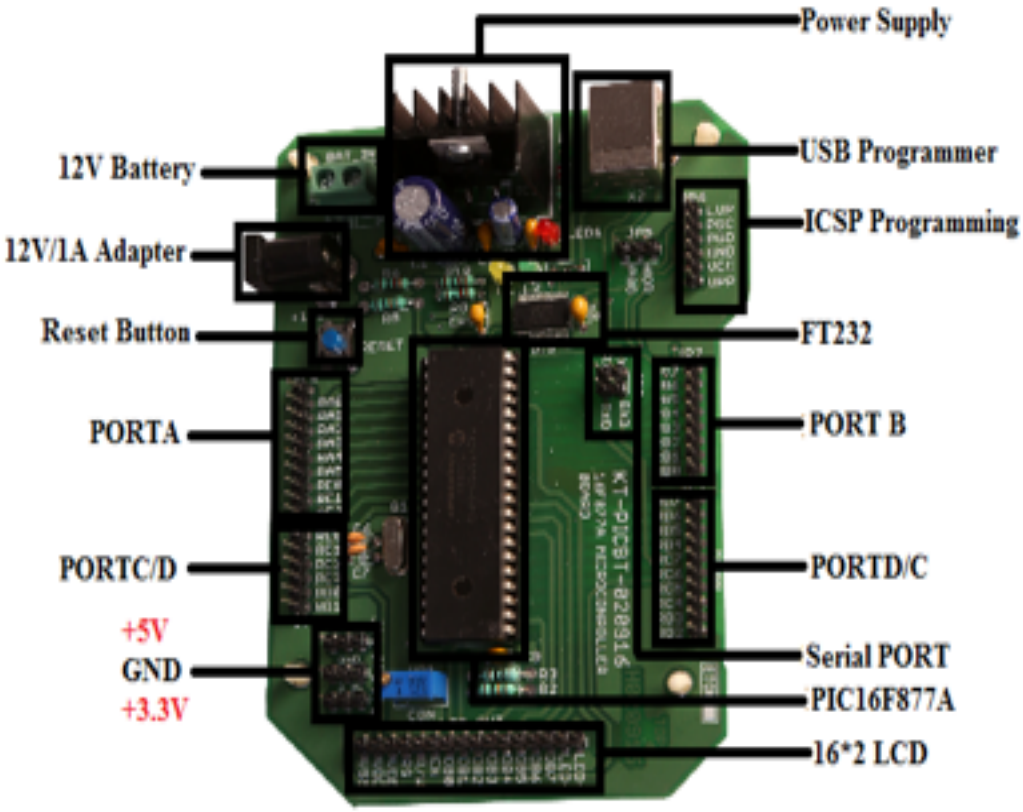
1. INTRODUCTION

Based on the Microchip 8-bit 40 pins PIC MCU (Peripheral Interface Controller - Micro Controller Unit), the KT-PICBT-020916 Training Board is developed. This training board is compatible for PIC16F family.

The hardware is highly assembled in which the system can be programmed by any compatible programming language such as assembly, BASIC and C (for PIC MCU). PIC MCU can be used for developing embedded projects, Applications of microcontroller, interfacing and mechanical hardware to get versatile.

The Software used is MPLAB IDE from Microchip Technology Inc. that has assembler which enable end-user to generate the program in assembly language. In order for ease understanding, flexibility the explanation and example programs provided here are on C language. This knowledge sharing data base deals with various sample codes used for several applications.

40 pins PIC Start-Up Kit - KT-PICBT-020916



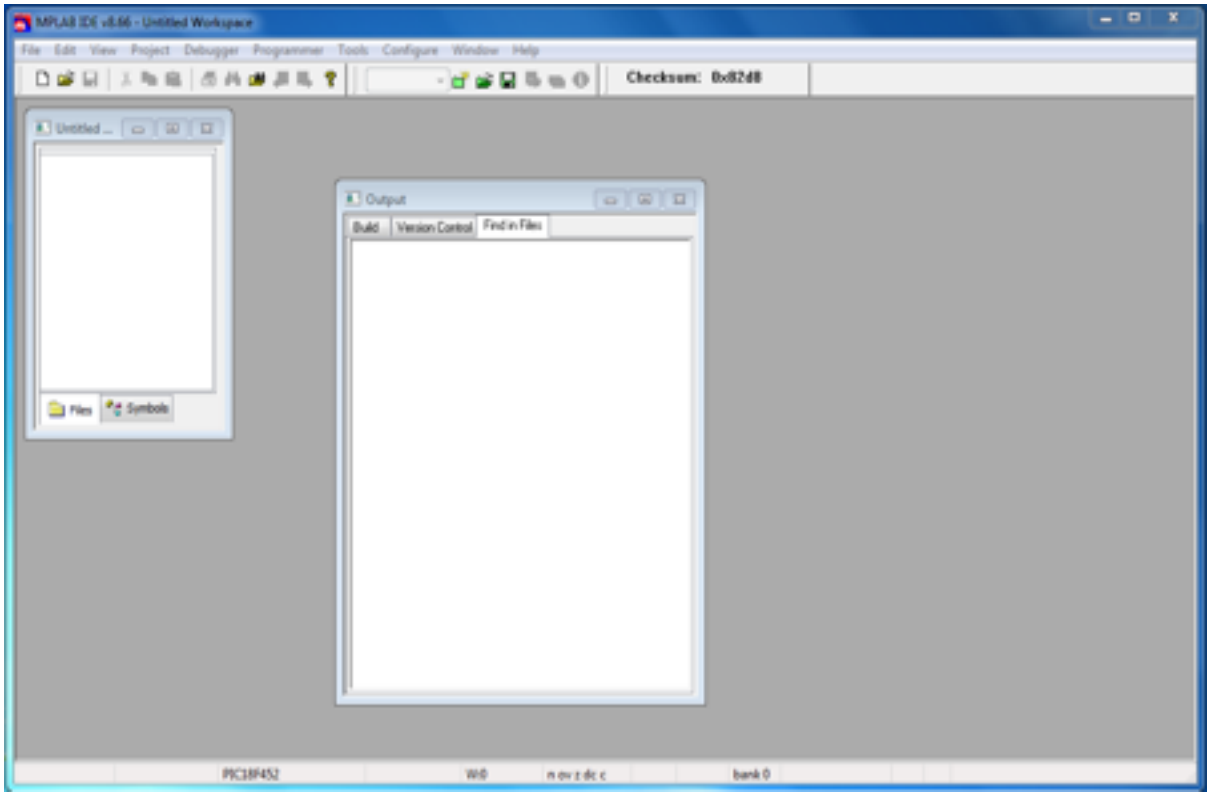
2. TO BEGIN WITH

2.1 To Open an Example from MPLAB IDE

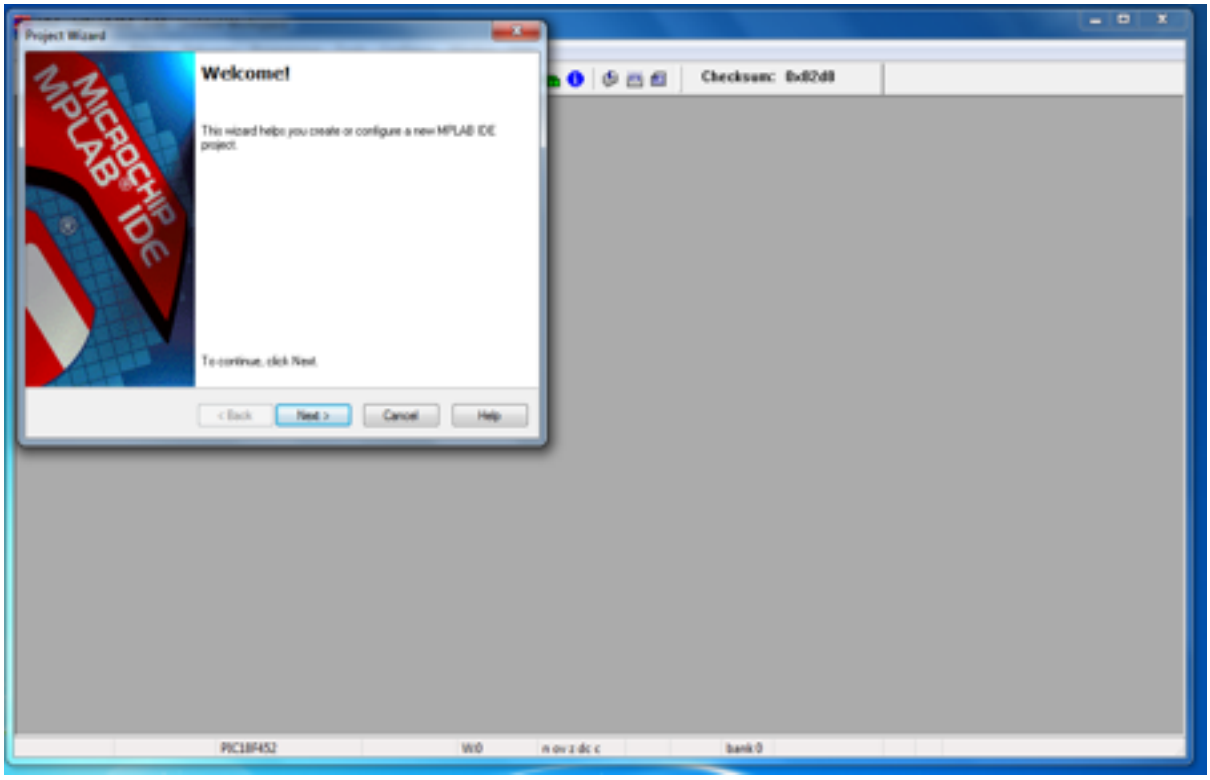
The MPLAB IDE and HI-TECH C compiler can be installed through the guidance of KT-PICBT-020916 User Manual. All the sample programs should be under “KT-PICBT-020916 Samples” folder. Once the installation gets over, double click the MPLAB IDE icon to open the Software.

New Project Creation in MPLAB:

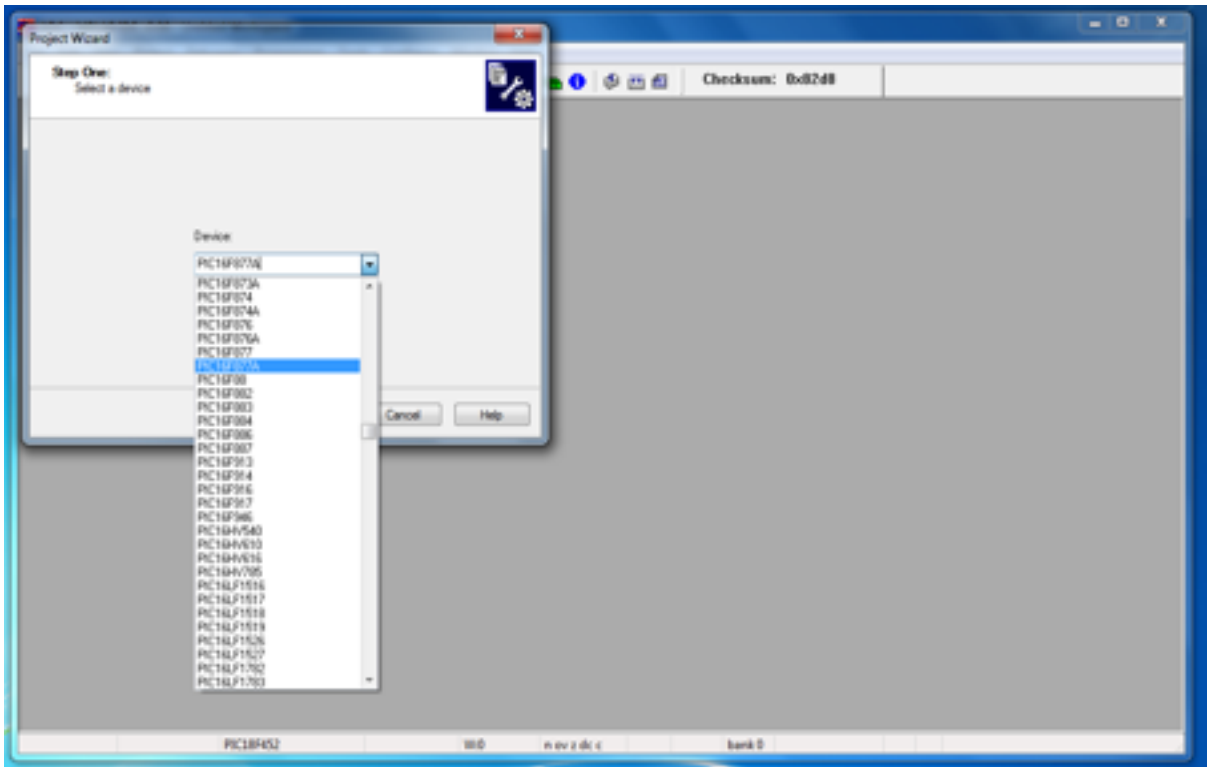
Step1: Open the MPLAB Workspace.



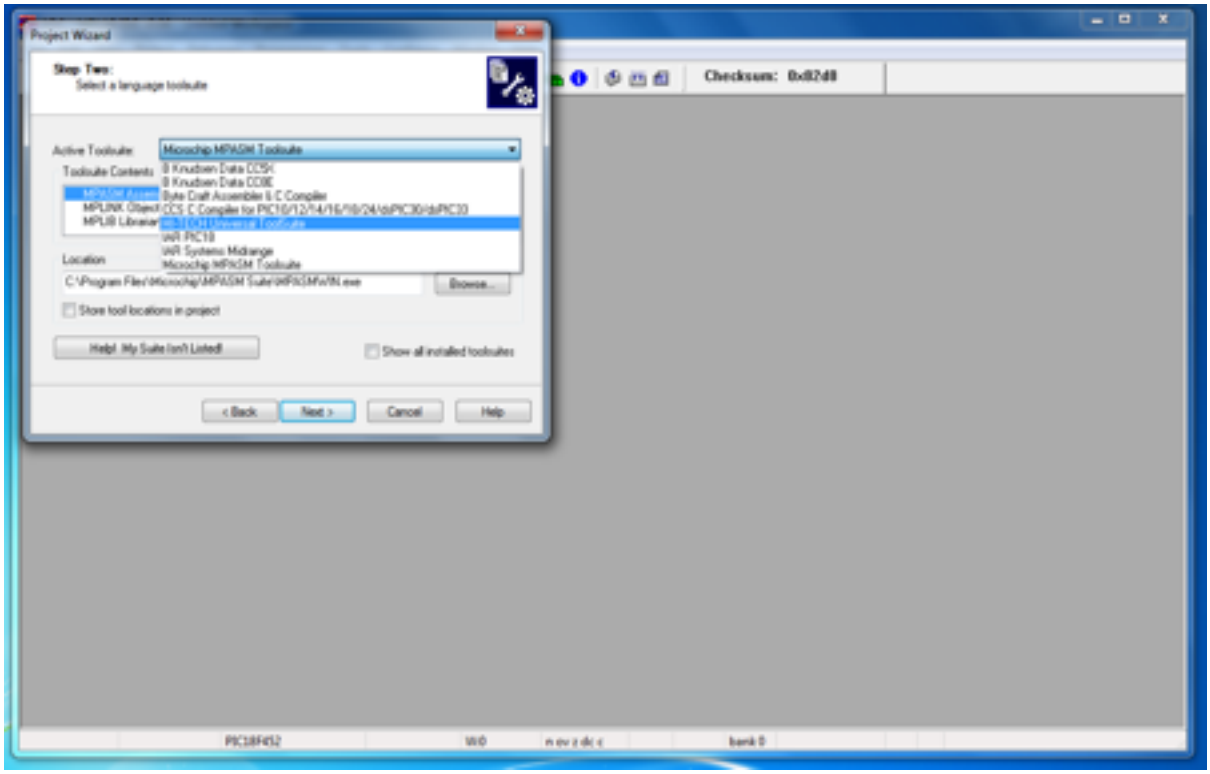
Step2: Click Project and then Click Project Wizard.



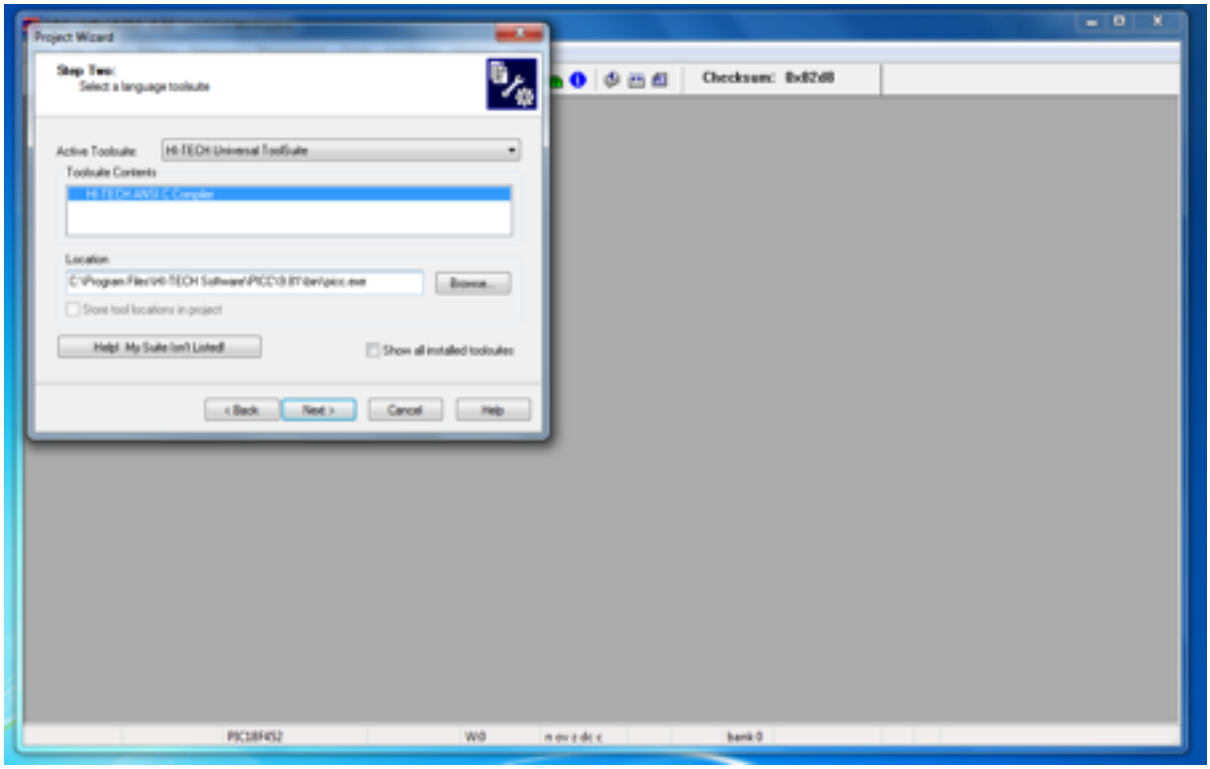
Step3: Click Next and then Select a Device.



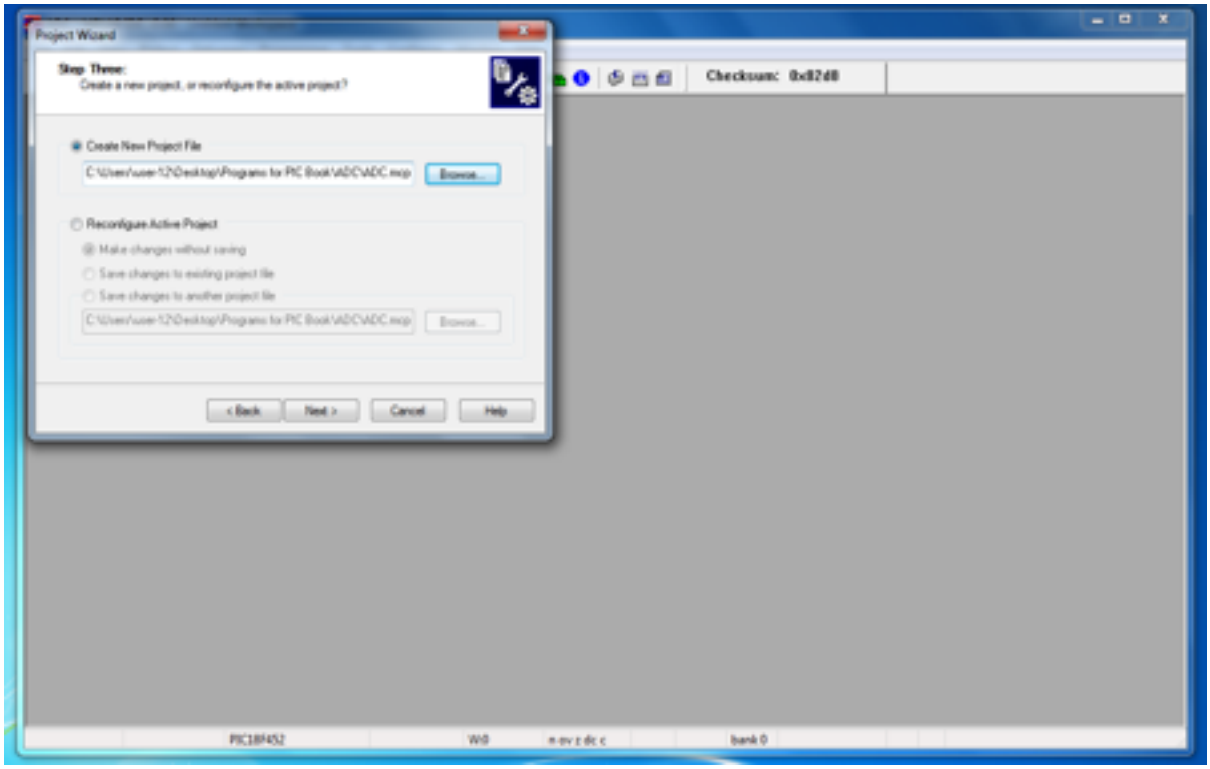
Step4: Click Next and then Select the Tool Suite.



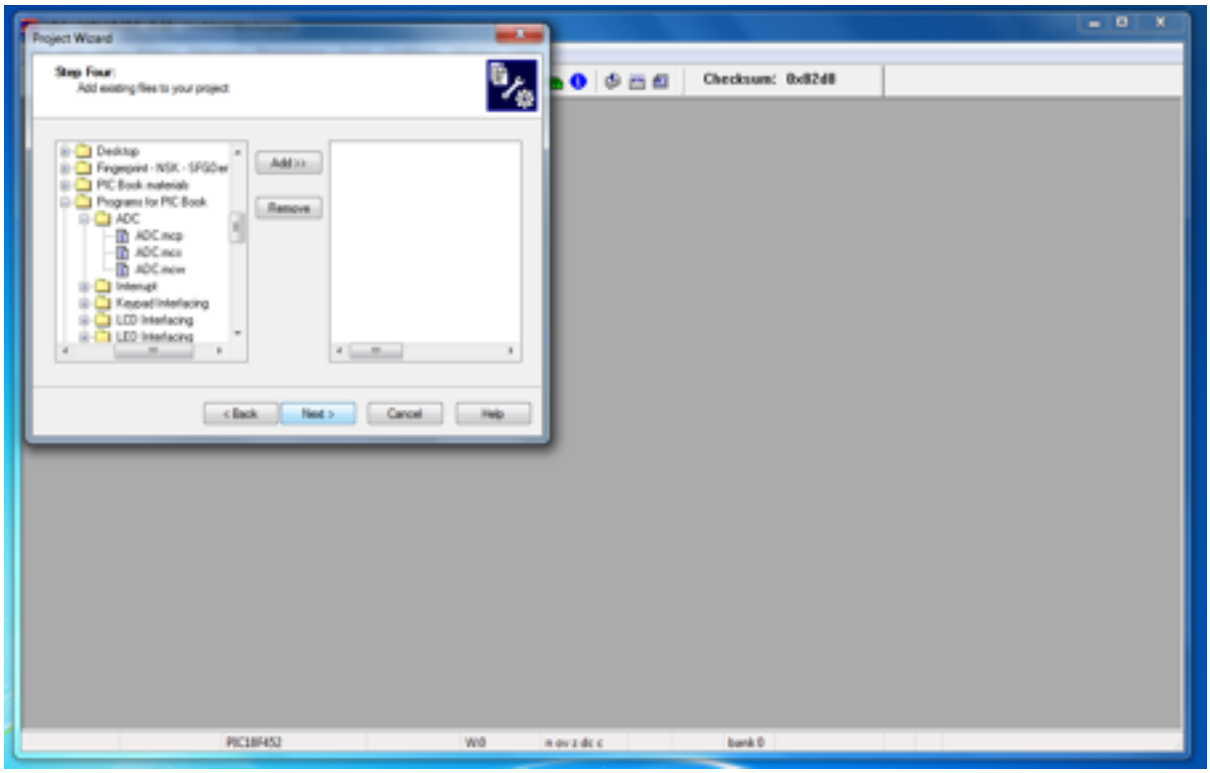
Step5: Click Next and then Select the Compiler.



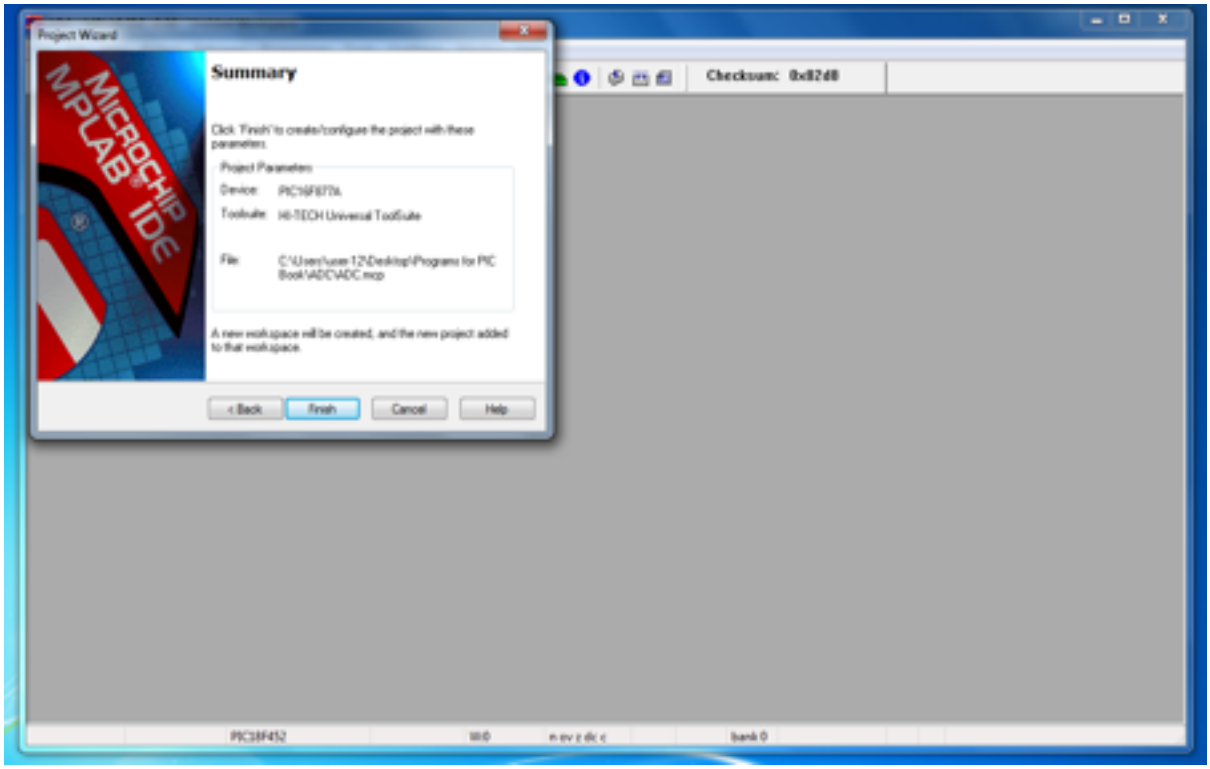
Step6: Click Next and then Create a New Project Folder.



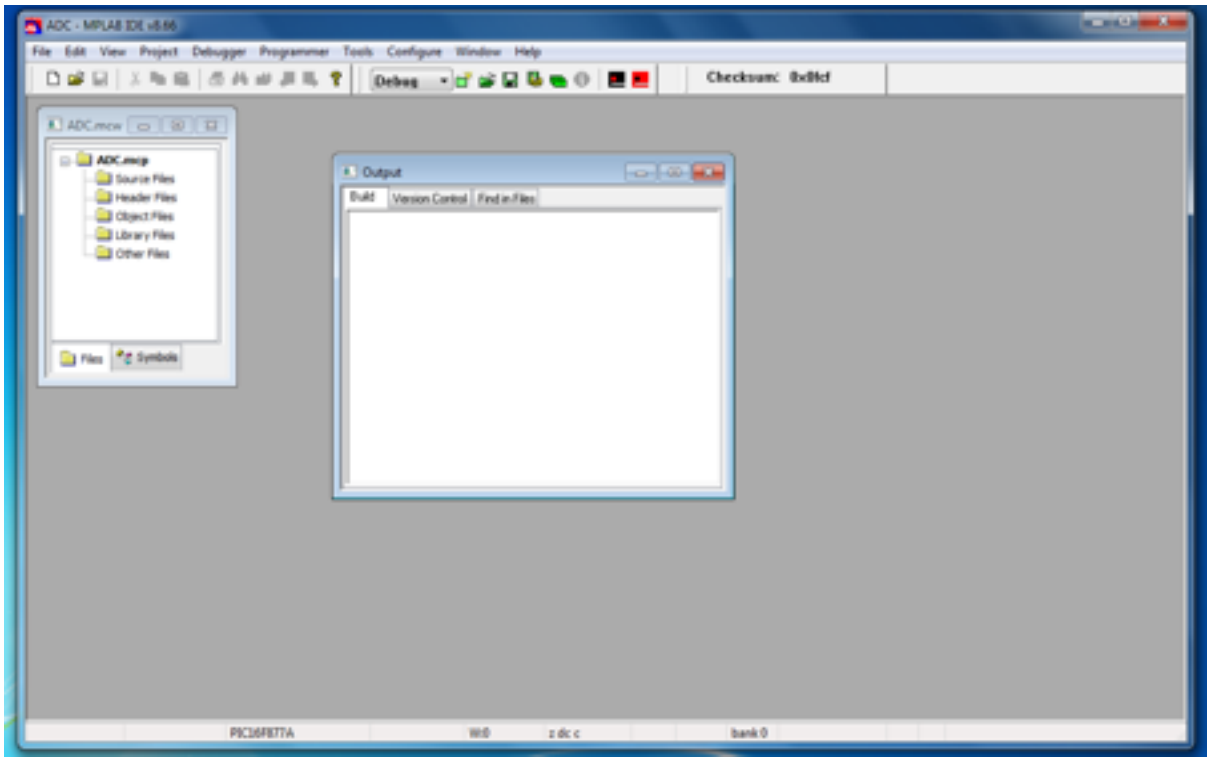
Step7: Click next and then add existing files to your project or click next.



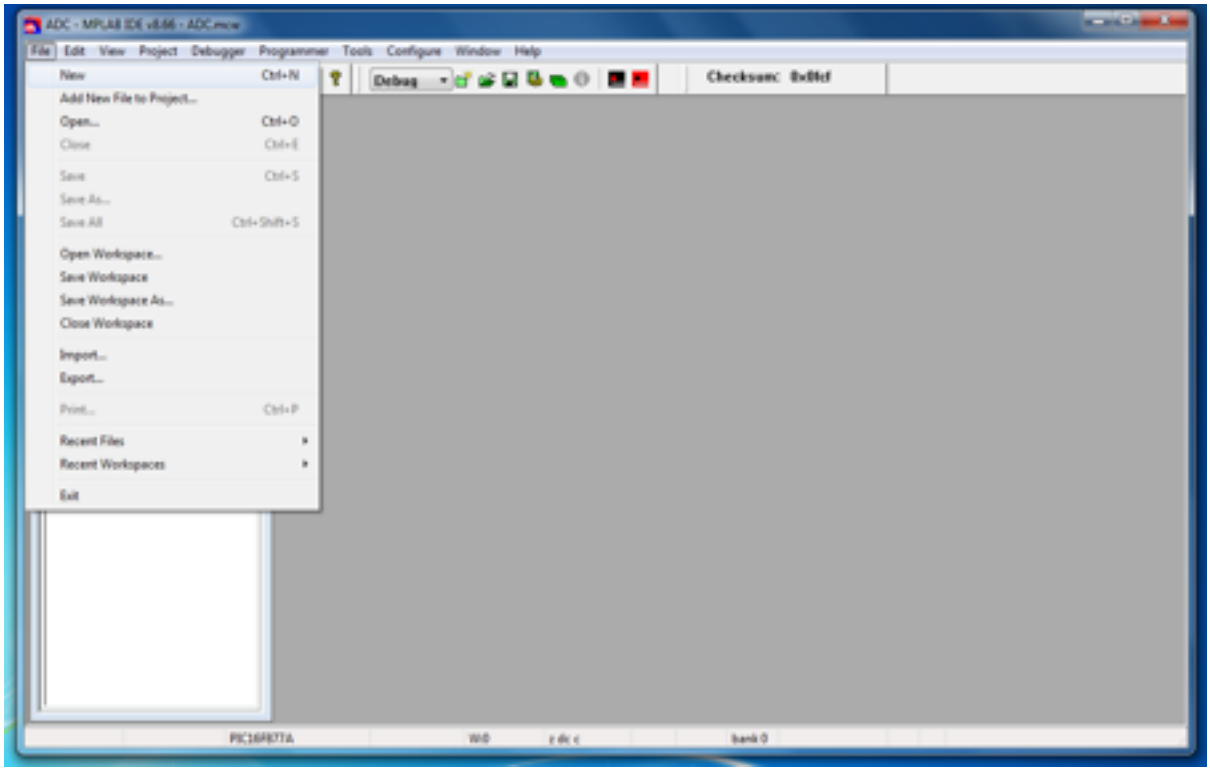
Step8: Click Finish to Create a New Project.



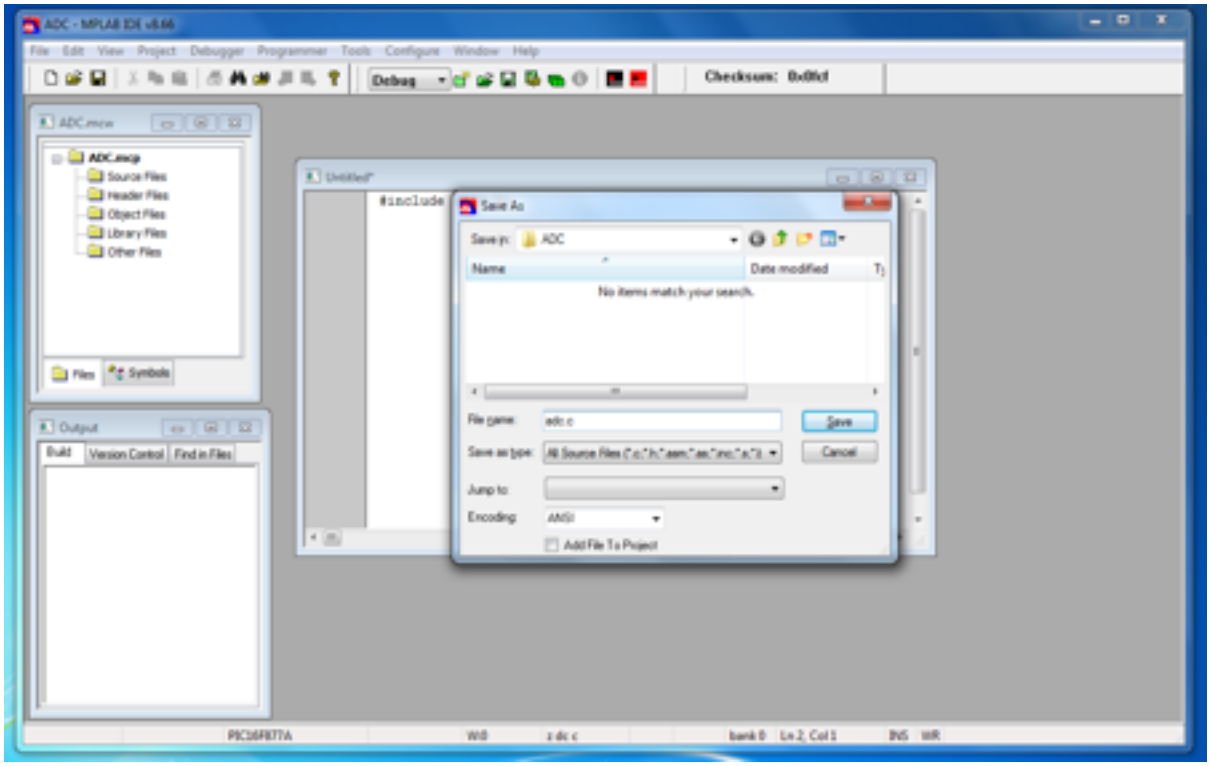
Step9: Project Window Created.



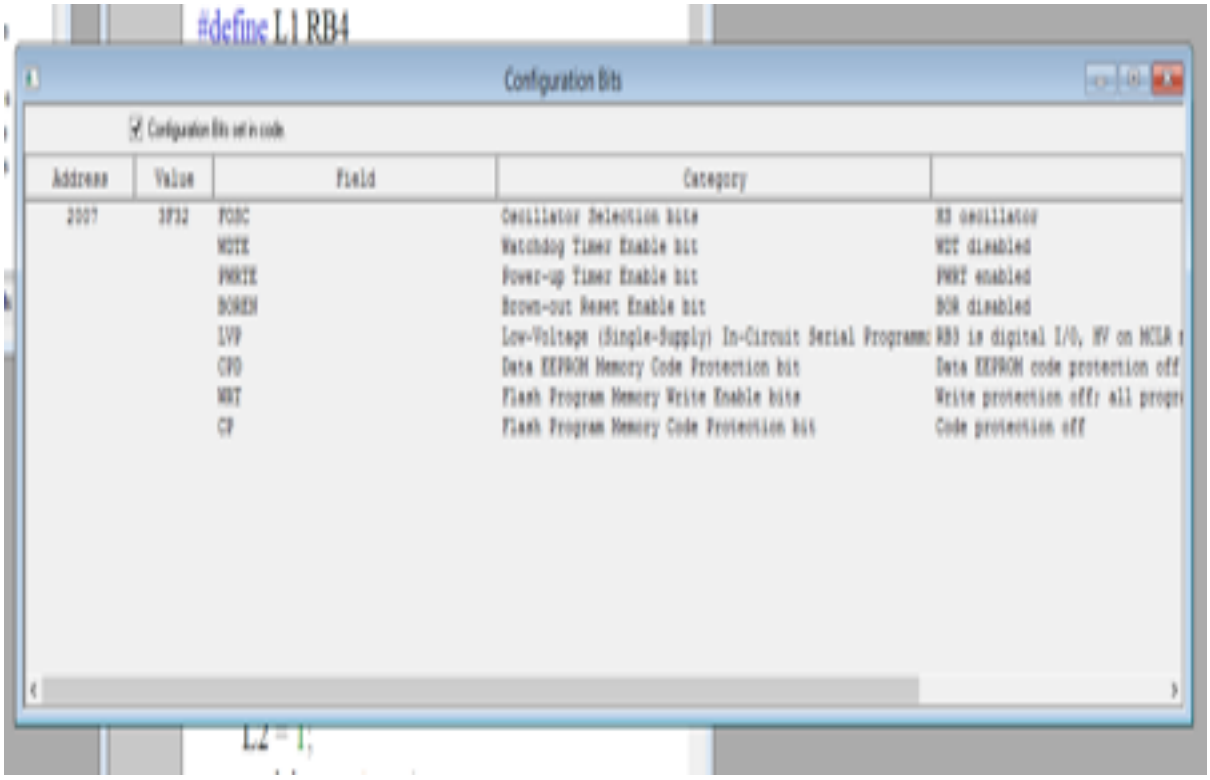
Step10: Create Files to this Project by Click File and Select New.



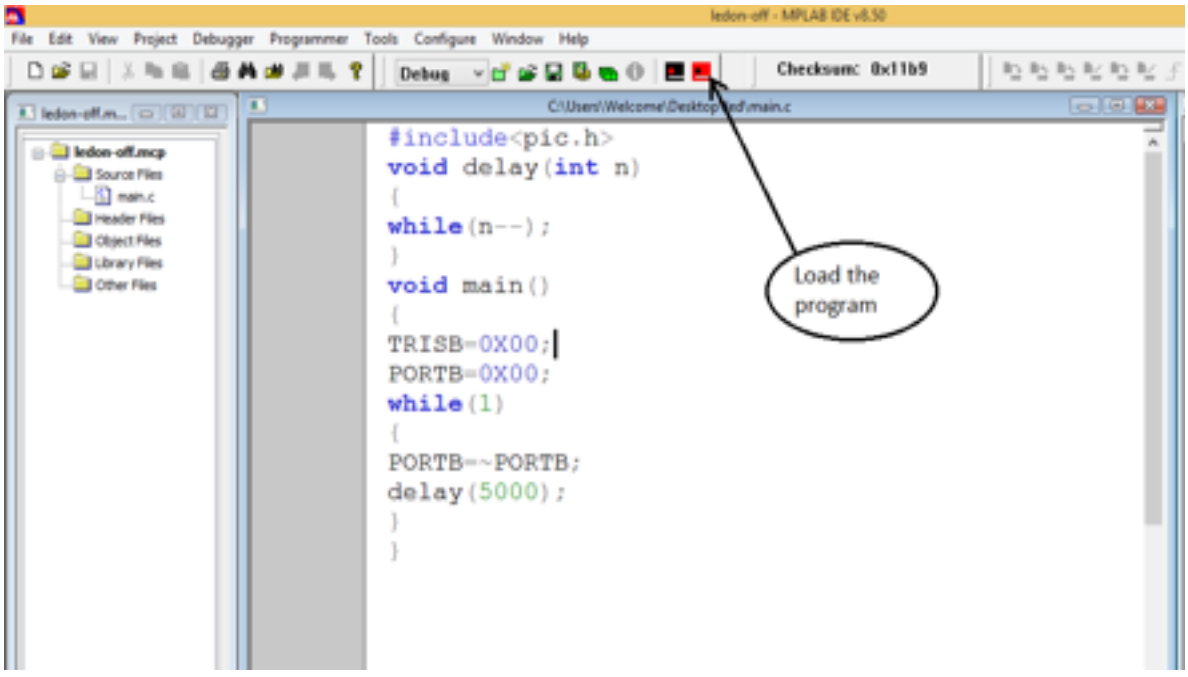
Step11: Save the File to the Project with c extension. Now add your main program file to the source file and Hader files to the header file.



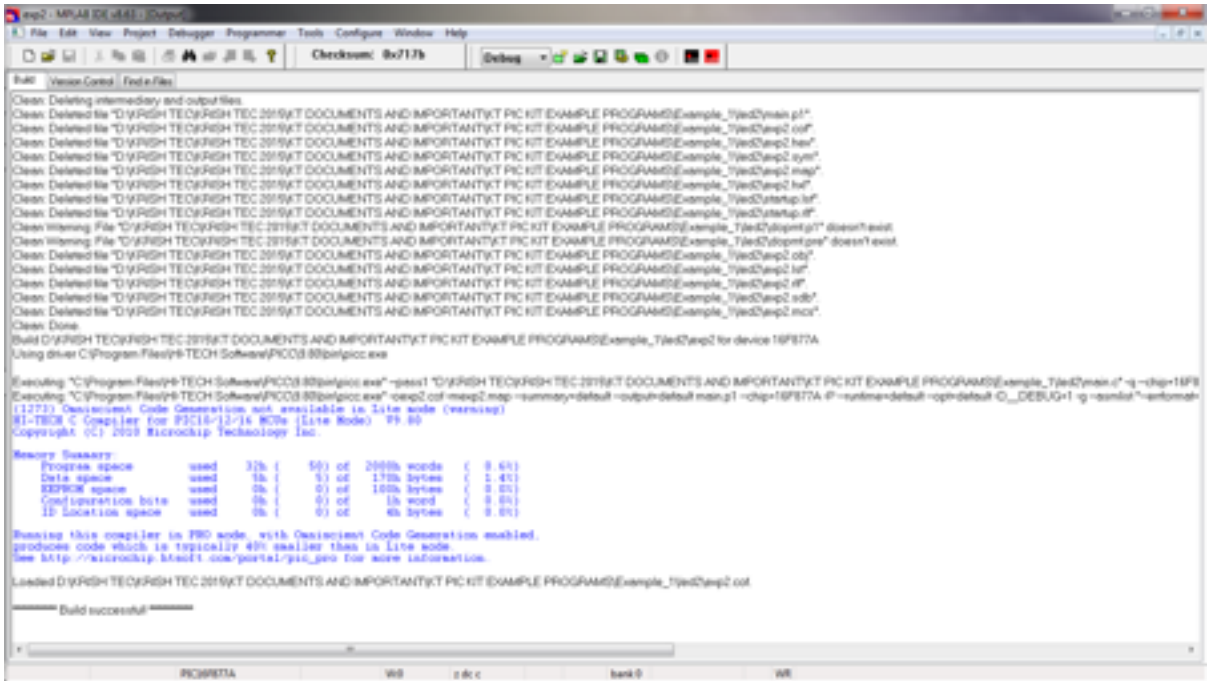
Step 12: Now configure the bit set.



Step13: Build Project.



Step 14: “Build Successful” Window

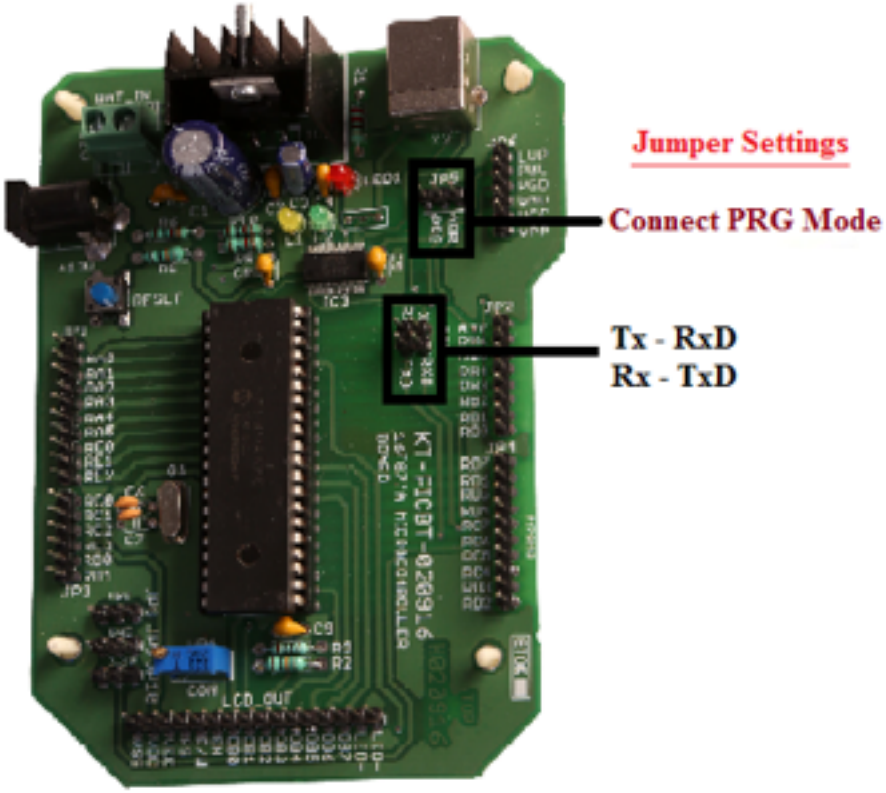


2.3 Upload the Program

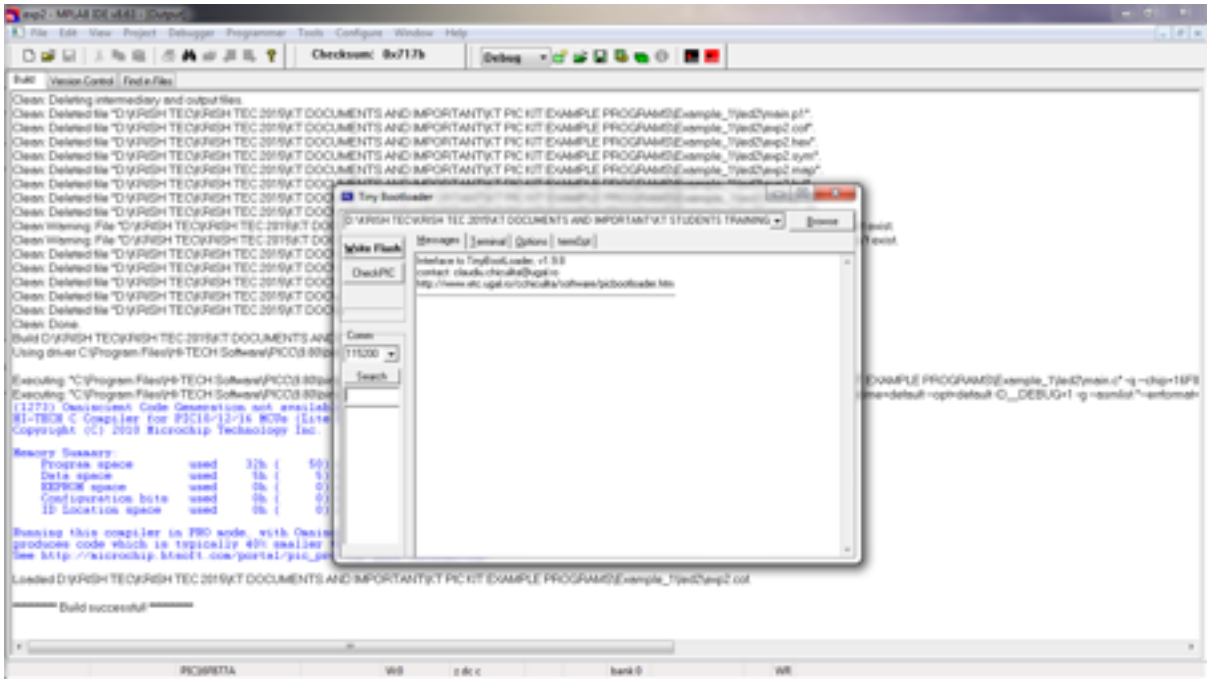
Step: 01

Jumper Settings:

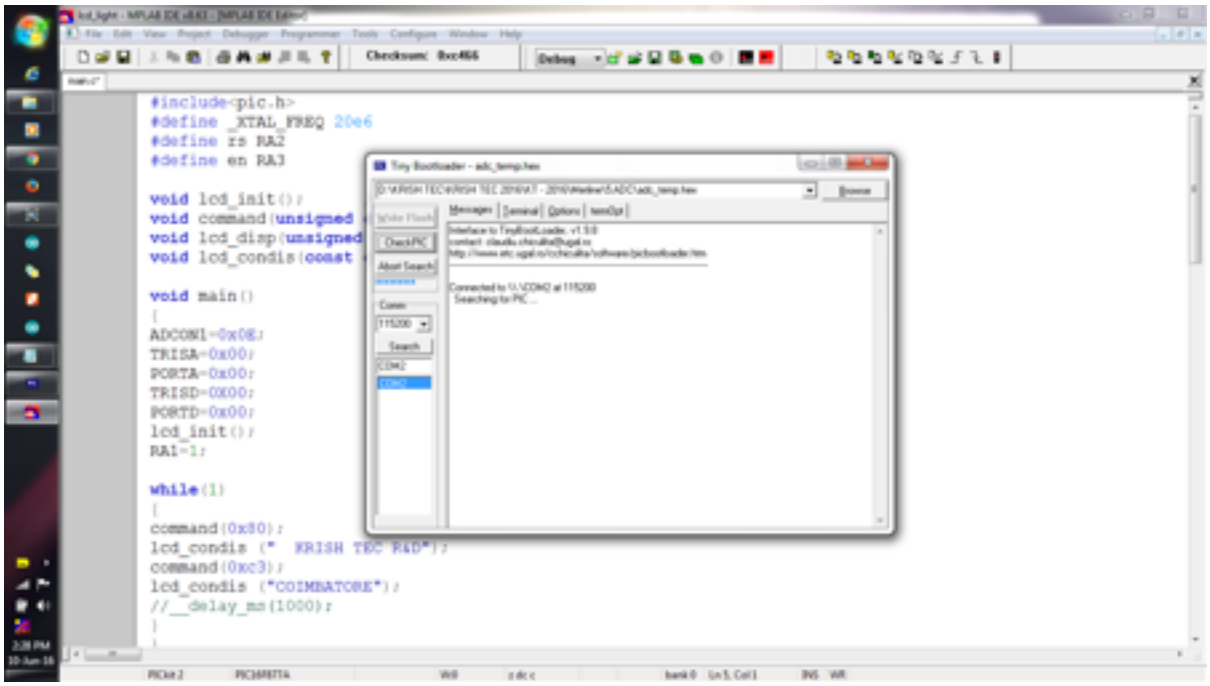
Step: 02



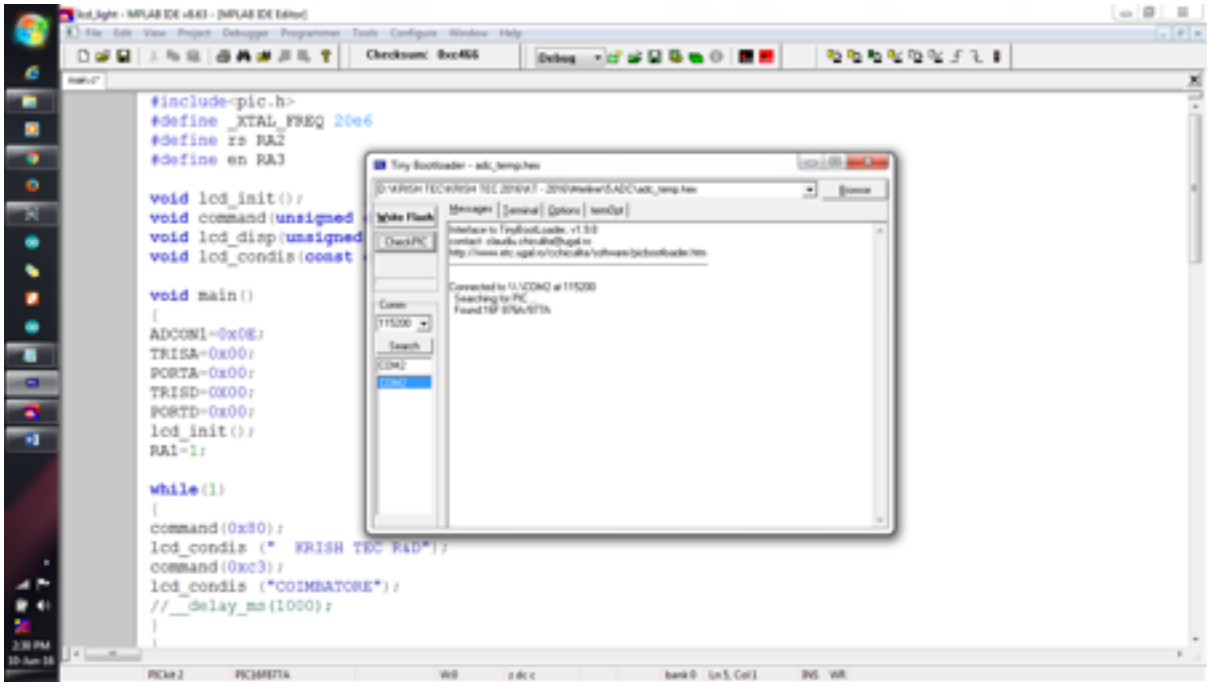
Step 03: Open the tiny boot loader file. After Check COM Port.



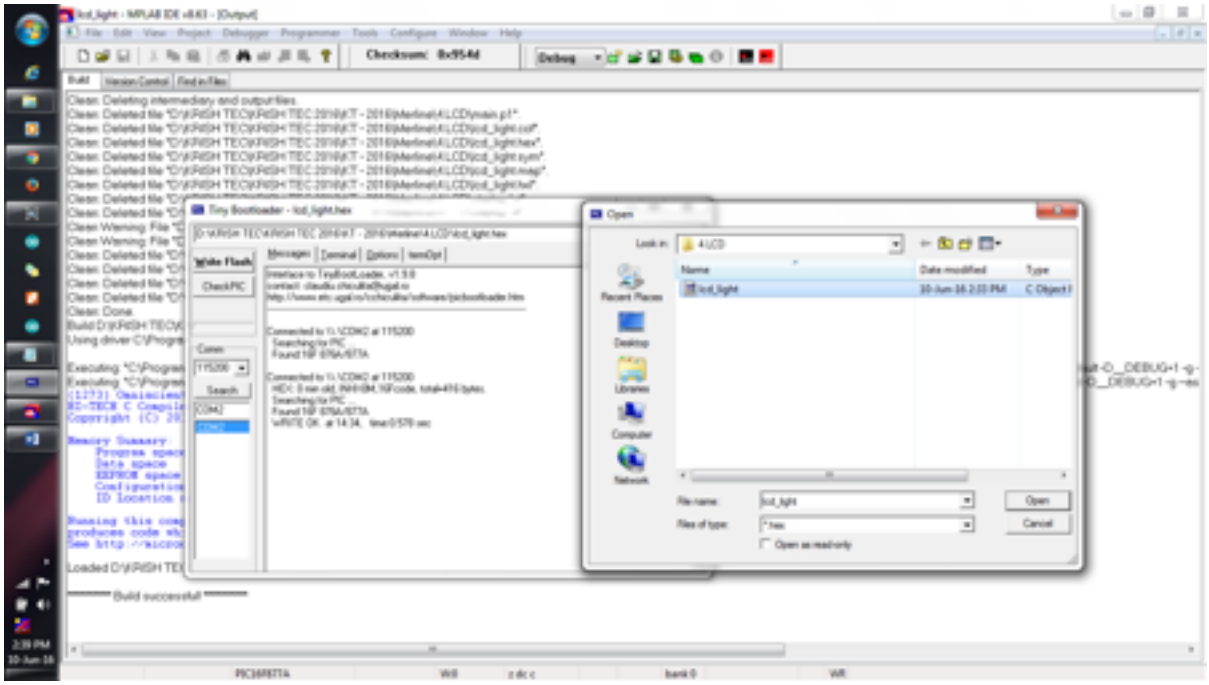
Step 04: Click “Check PIC” to search the connected PIC Unit.



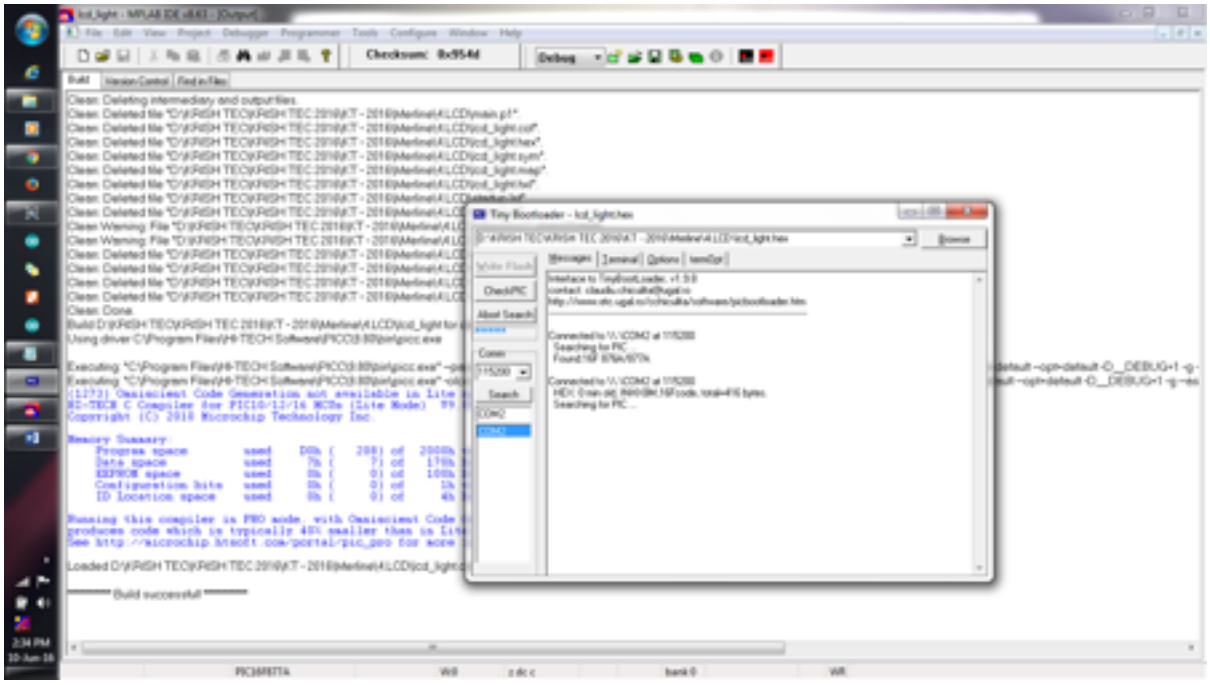
Step 05: PIC Unit got connected to COM2.



Step 06: Browse and Upload the hex file in the corresponding project.



Step 07: Click to Write Flash, once got uploaded.



3. Examples

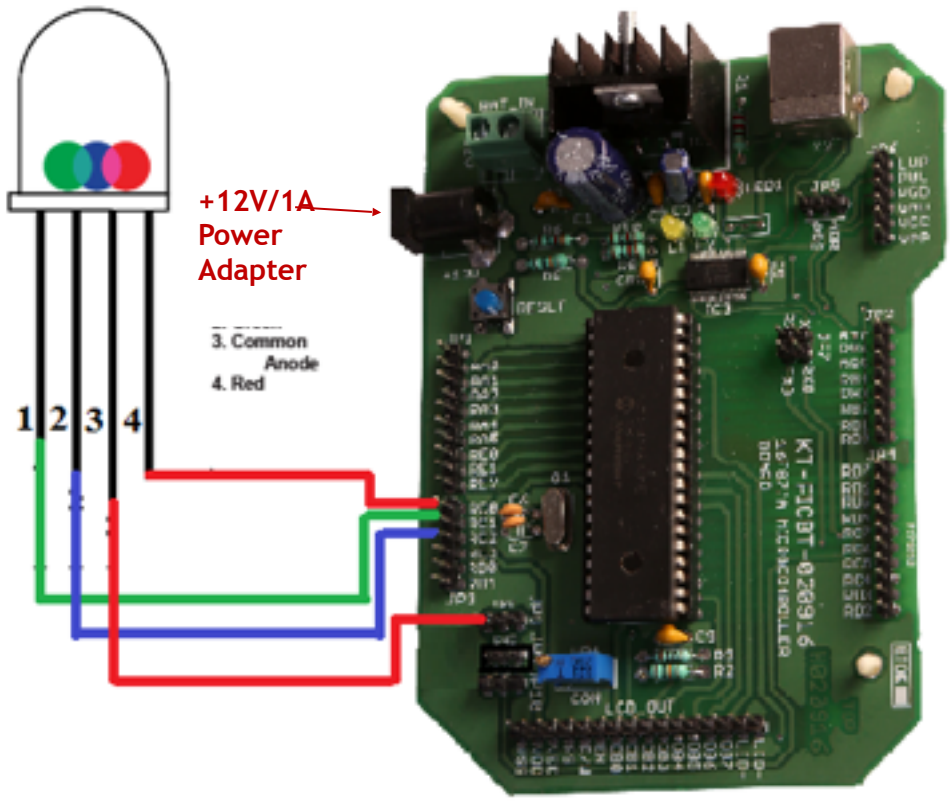
3.1 LED Flashing

In this Example we going to Flash On board LED's. Now load Example 1.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in the section 2.3.

Final Result:

Thus the on board LED's L1, L2 and L3 will blink alternatively for every 1 sec.

OUTPUT:



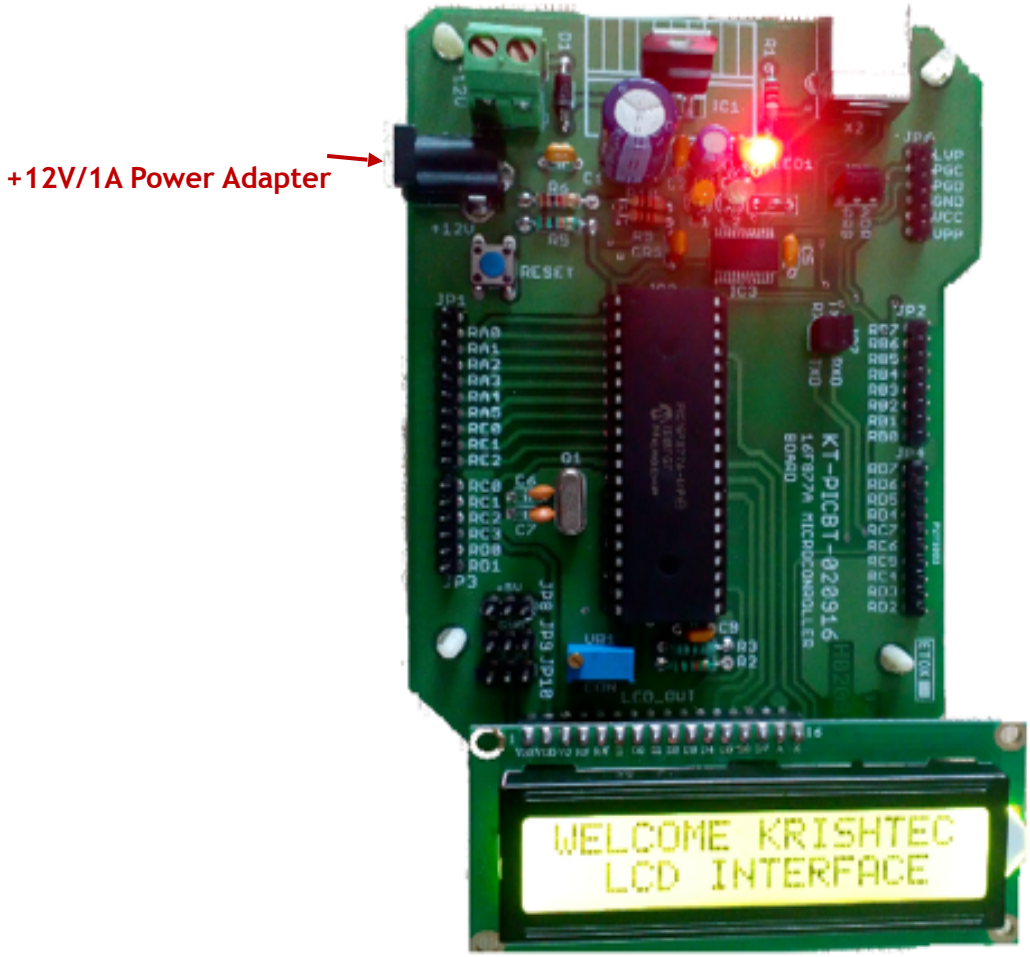
3.2 LCD Interfacing

In this Example we going to display some characters on 16*2 LCD display. Now load Example2.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in the section 2.3.

Final Result:

Thus the 16*2 LCD Display will display the text "WELCOME KRISHTEC LCD INTERFACE".

OUTPUT:



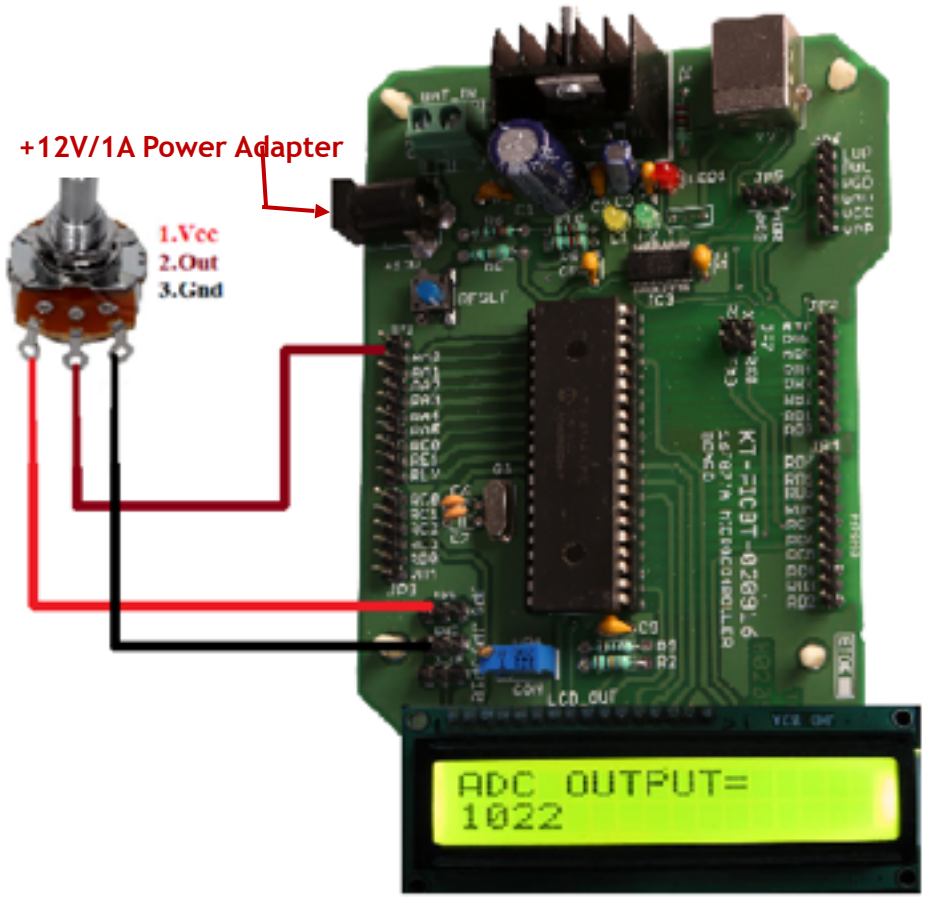
3.3 ADC Interfacing

In this Example, we going to measure and display Analog value which is according to the instant variation of the resistance of the potentiometer using 16*2 LCD display. Now load Example3.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in section 2.3.

Final Result:

Thus the Analog value measured is displayed in 16*2 LCD display.

OUTPUT:



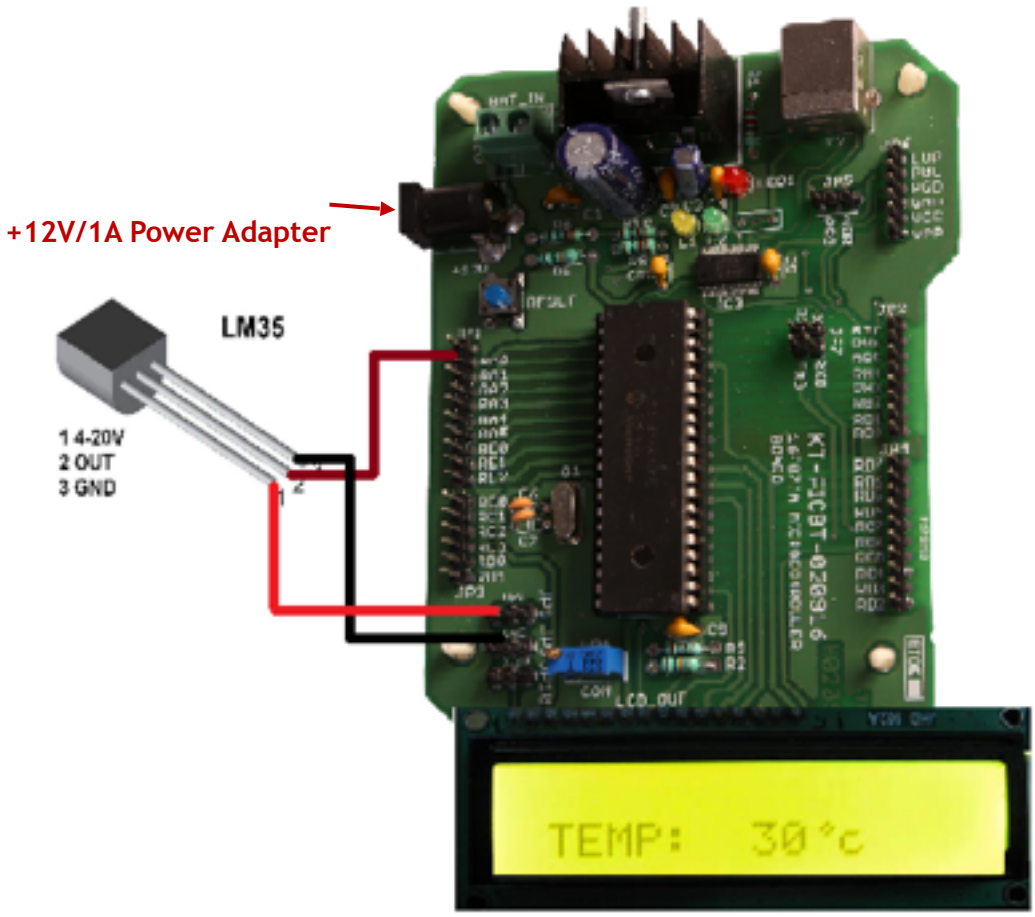
3.4 LM35 Temperature Monitoring

In this Example, we going to measure and display temperature in 16*2 LCD display. Now load Example4.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in section 2.3.

Final Result:

Thus the temperature value measure and displayed in 16*2 LCD.

OUTPUT:



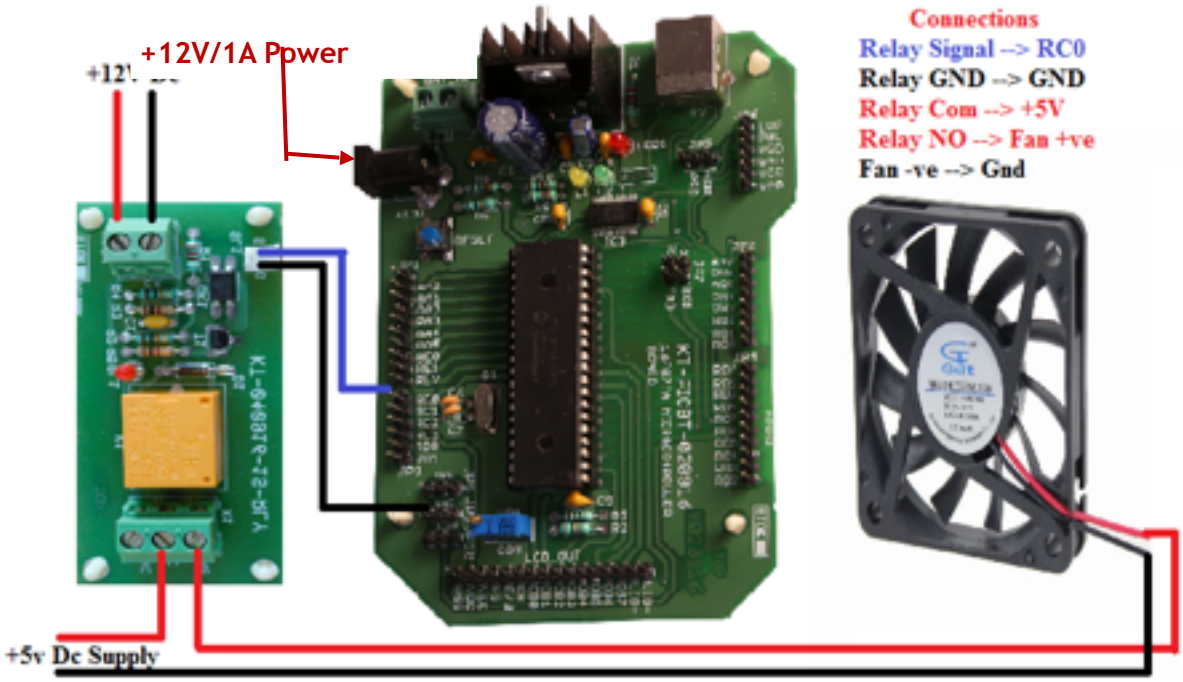
3.5 Relay Interfacing

In this Example we going to trigger the relay based on the Switch status. Now load Example5.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in the section 2.3.

Final Result:

Thus the on board Relay will be triggered based on the Switch status SW1 and SW2.

OUTPUT:



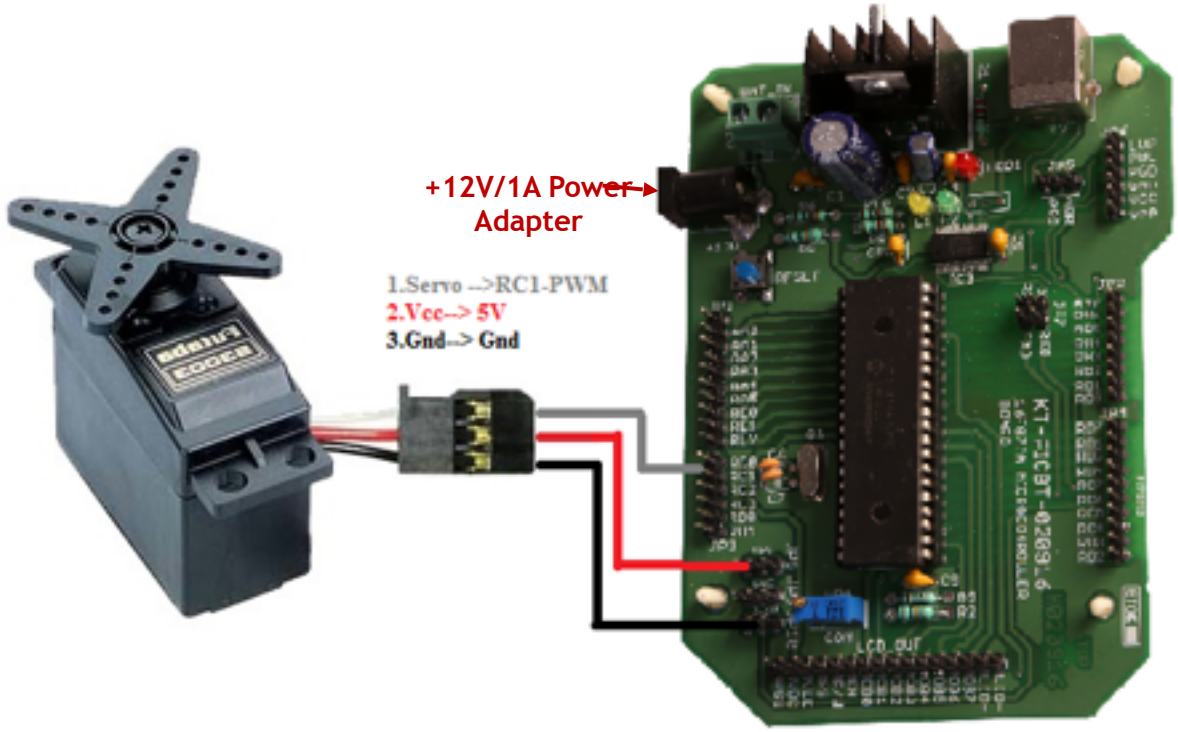
3.6 Servo Motor Interfacing

In this Example we going to interface Servo motor with 16f877A. Now load Example10.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in the section 2.3.

Final Result:

Thus the Servo motor is interface with 16F877A microcontroller.

OUTPUT:



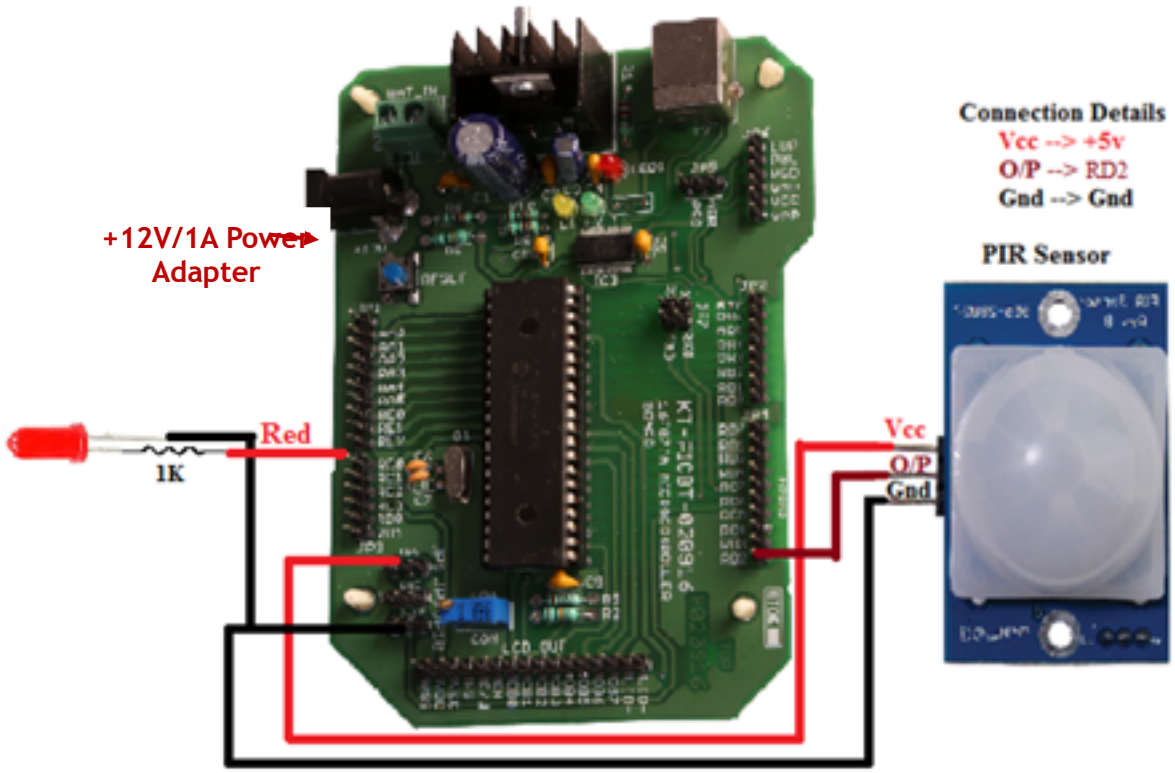
3.7 PIR Sensor Interfacing

In this Example we going to Interface the PIR Sensor. PIR sensor is passive infrared sensor also called human detected sensor. If PIR Sensor detects any human. Then LED will glow human detected. Now load Example6.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in section 2.3.

Final Result:

Thus the PIR sensor is interfaced with 16F877A and alert system is developed.

OUTPUT:



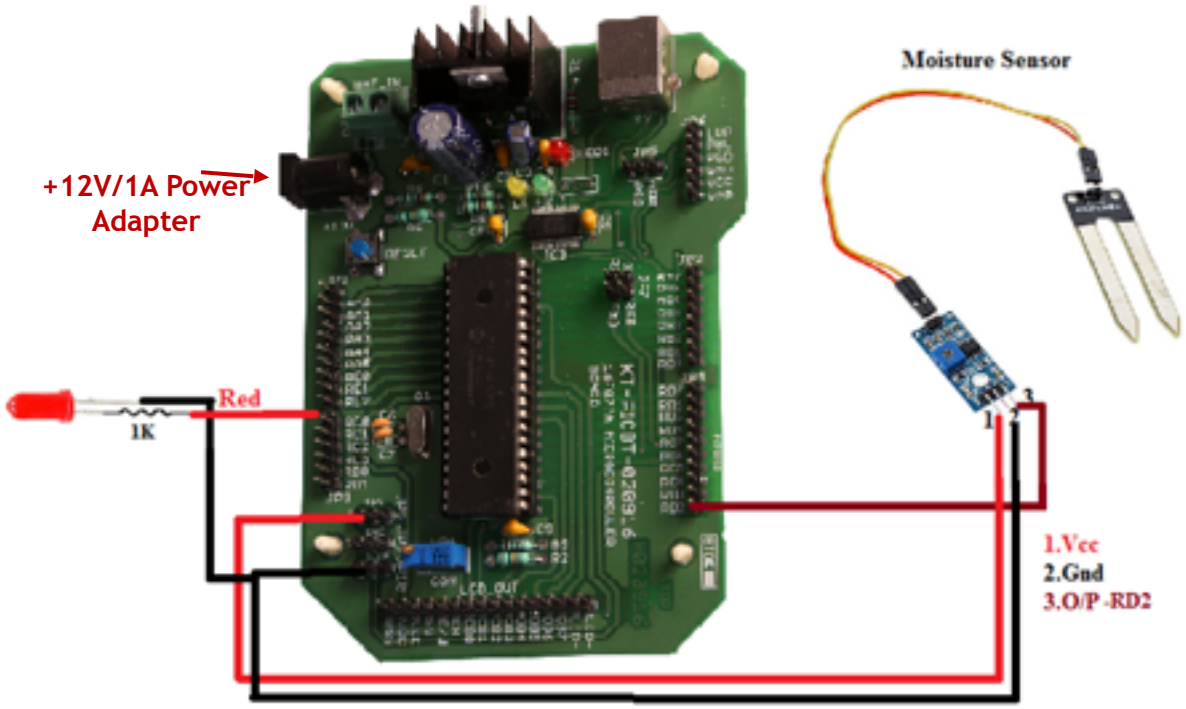
3.8 Moisture Sensor Interfacing

In this Example we going to trigger the relay based on the Moisture Sensor. Moisture sensor is detect land moisture level. If land moisture level dry means LED will be trigger. When moisture level full means LED will be off condition. Now load Example7.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in section 2.3.

Final Result:

Thus the relay will be triggered when land moisture level is low.

OUTPUT:



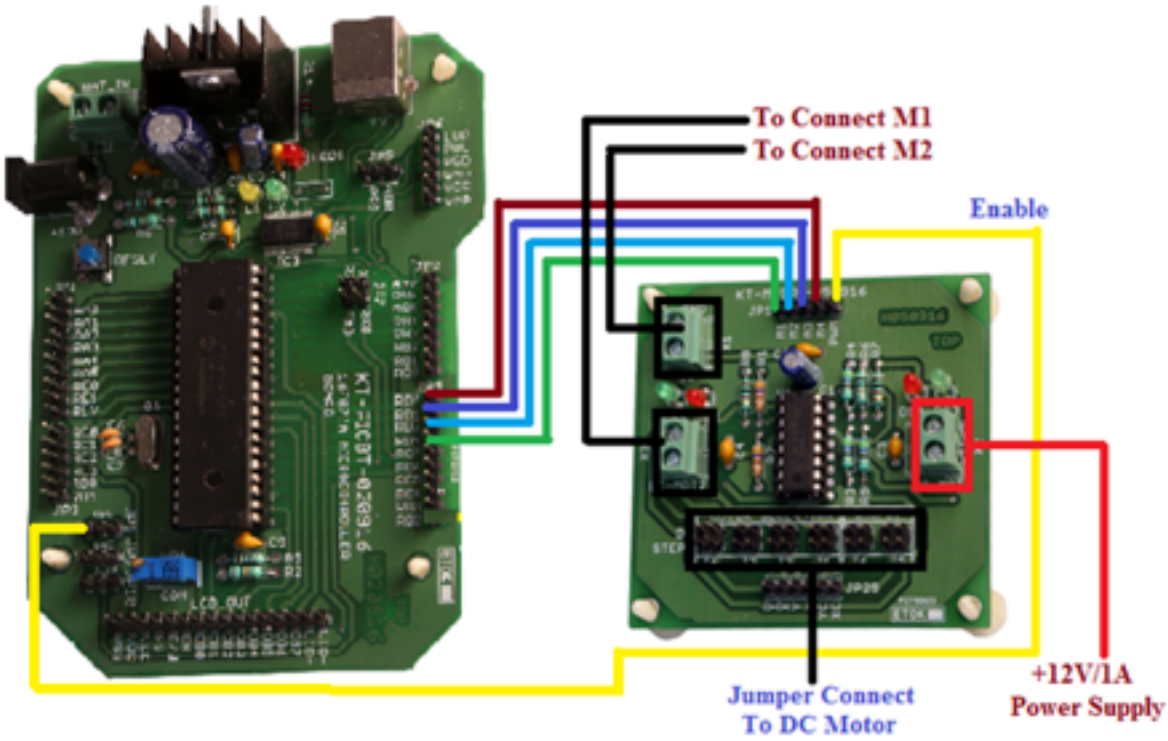
3.9 DC Motor Interfacing

In this Example we going to interface DC motor with 16f877A using L293D Motor Driver. Now load Example8.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in the section 2.3.

Final Result

Thus the DC motor is interface with 16F877A microcontroller using L293D motor driver.

OUTPUT:



+12V/1A Power Adapter

3.10 Stepper Motor Interfacing

In this Example we going to interface Stepper motor with 16f877A using L293D Motor Driver. Now load Example9.hex file to the target device using MPLAB IDE and Tiny Bootloader as we discussed in the section 2.3.

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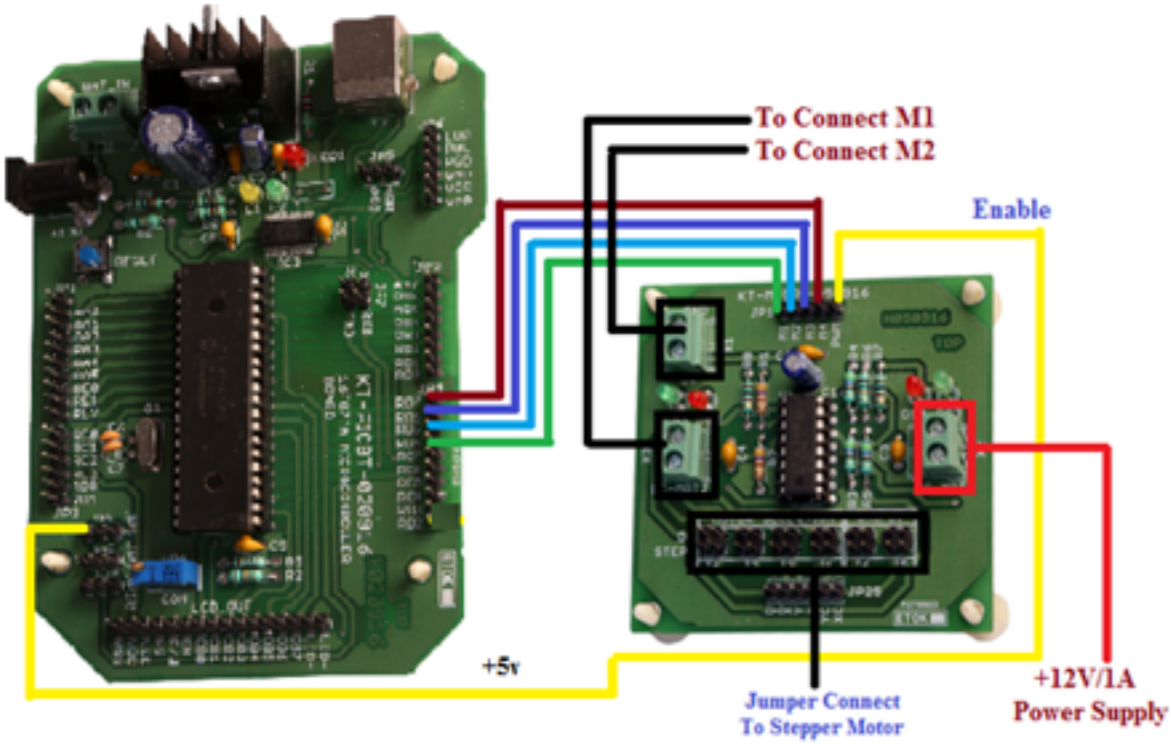
Final Result:

Thus the Stepper motor is interface with 16F877A microcontroller using L293D motor driver.

OUTPUT:



+12V/1A Power Adapter

Features and Specifications:

- Fully tested before shipped to customer
- Compact, powerful, flexible and robust start-up platform
- Suitable for hobbyists, students, lecturers, engineers and experts
- Save development and soldering time
- No extra components required for the PIC to function
- All 36 I/O pins are nicely labelled to avoid miss-connection by users
- No more frustrated work plugging PIC out and back for re-programming
- Perfectly fit for 40-pin 16F PIC Microcontrollers
- Power via USB or external DC adapter (7 - 12V).
- On board 5V 800mA (Max 1A) voltage regulator.
- On board 3.3V 500mA (Max 500mA) voltage regulator.
- USB mini-B receptor for USB connection.
- 36 digital I/O pins.
- 8 analog input pin.
- Extra pads with standard 0.1” (2.54 mm) pitch to pitch.
- 8KByte flash/program memory.
- On board Power, Run and programmable LED.
- Reset jumper and bootloader jumper for entering USB bootloader mode.
- Program with MPLAB X IDE and XC8 compiler (library is open source and provided)
- Program loading via USB HID, GUI from Microchip provided.
- PICkit standard ICSP 6-way pads for direct program loading (optional)
- Dimension: 85mm x 55mm