Design and Implementation of LUX METER

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***Abstract*—** Lux Meter is very widely used in all over the world now-a-days.It has applications in medical sector,agricultural sector,schools,offices and so much more. Lux Meter is a very useful instrument that can accurately measure the light intensity.The purpose of this experiment is to design and implement a Lux Meter which can determine the light intensity precisely and show it on the LCD module.The project is to be carried out by four group members.

Keywords— LUX, LDR, PIC 16F73 microcontrollor, IC 7805, Pickit 2 loader, LCD Module.

I. INTRODUCTION

The device which measure illuminance and luminous emittance is called lux meter. It measures luminous flux covering a surface area.The light sensor that we have used is a light dependent resistor (LDR) whose resistance changes as the amount of light falling on it is varied.The relationship between lux and the resistance of an LDR is exponential.Therefore,a Lux Meter can be made by collecting the values of light intensity and voltage according to the relationship between resistance of LDR and light intensity and programming it into the microcontroller and calibrating with a standard lux meter. The parameters that effects the accuracy of a Lux Meter are its range and resolution.This is why it's very important to perform the calibration before doing any measurement.The Lux Meter has many indoor and outdoor applications which makes this a very important device. [1]

II. METHODOLOGY

A. Required Equipments

1. PIC 16F73 microcontroller
2. PIC software
3. IC 7805
4. 10k ohm resistor
5. Light dependent resistor(LDR)
6. Multimeter
7. Pickit 2 loader
8. Breadboard

9.16x2 Display

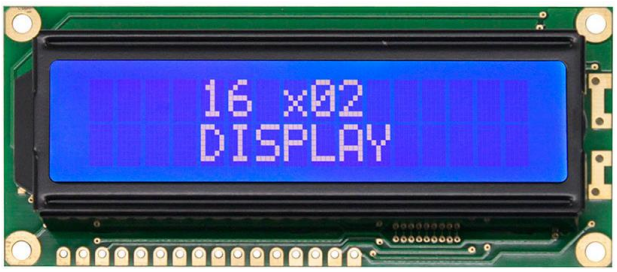


Fig.01: 16x02 LCD Module

B. System Description

The microcontroller was connected to the 16x2 LCD Display to show the amount of lux level at the display.A light dependent resistor(LDR) was used whose resistance changes as the amount of light falls on it is changed.An LCD display is used to show appropriate values of Lux as we took values for different light intensities.A crystal oscillator of 8 MHz was used.IC 7805(voltage converter) was used to convert the 9 volts dc to 5 volts dc.We've also

used a multimeter to make sure that all the components were working properly and to measure the voltages.

C. Circuit Diagram

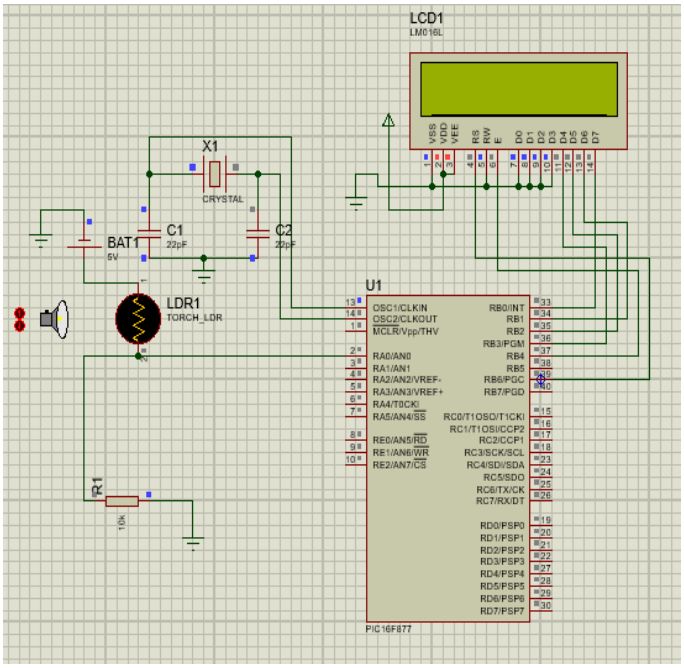


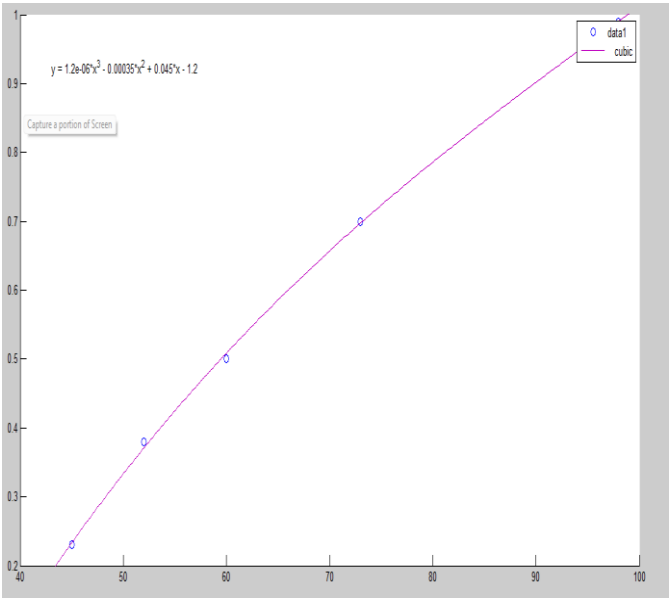
Fig.02: Required circuit diagram

D. Results

We've taken five observation data which are shown below :

Obs.No	LUX	Voltage(volts)
01	45	0.23
02	52	0.38
03	60	0.50
04	73	0.70
05	98	0.99

The resultant graph plotted in matlab is as following :



E. Conclusion

The main application of Lux Meter is to accurately measure the light intensity.In this project,we have determined the level of illumination for different lighting conditions.The result was less accurate during the daytime for the interference of daylight.But during the night time we were able to determine the lux value somewhat precisely by using a flashlight and varying its brightness.[2]As the light intensity was increased,The conductivity of the LDR increased and vice versa.Therefore, the LDR resistance can work as a tool to determine the light intensity. [3] The pickit 2 loader was used to input the code into the microcontroller which helped us to finally complete our experiment.

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