# 8051 microcontroller based optical detector

## Group member's details

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## Objective

The main objective of this project is to develop a 8051 microcontroller based light detector to sense the optical light falling on it.

## Definition

It is used to convert the optical/light signal into electrical signal. Light detectors are one of the essential components in the field of optoelectronics.

## Sample block diagram


Fig:1. Sample block diagram

Figure 1 depicts sample working of the optical detector. The main principle of the detector is to convert the amount of light falling on the device into electrical signals.

## Components Required

- Microcontroller LCD display
- Photo-resistor (LDR)
- Resistors
- Jumper wire
- Potentiometer

## Block Diagram/Circuit Diagram

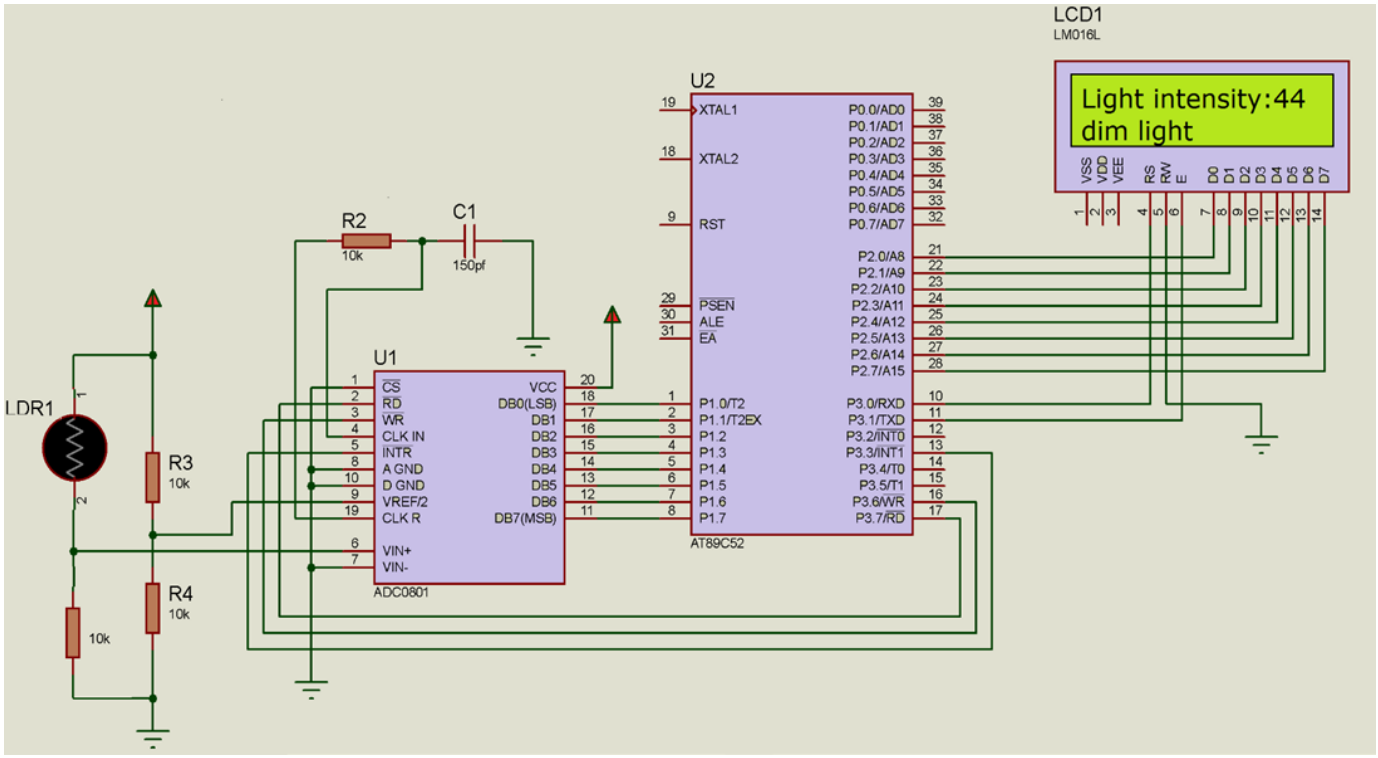


Figure 2: sample block diagram

## Code

```
#include<reg51.h>
#define lcd P2

sbit light=P1^0;

sbit rs=P3^2; //
sbit rw=P3^3;
sbit en=P3^4;

void lcd_init();
void cmd(unsigned char);
void dat(unsigned char);
void delay();
void lcd_string(char *s);

void main()
{
   lcd_init();
   lcd_string("  Light Detector   ");
   while(1) {
      if(light) {
         cmd(0xc0);
         lcd_string("     No Light  ");
         delay();
      } else {
         cmd(0xc0);
         lcd_string(" Light Detected ");
      }
   }
}

void lcd_init()
{
   cmd(0x38);
   cmd(0x0e);
   cmd(0x06);
   cmd(0x01);
   cmd(0x80);
}

void cmd(unsigned char a)
{
   lcd=a;
   rs=0;
   rw=0;
```

```
   en=1;
   delay();
   en=0;
}

void dat(unsigned char b)
{
   lcd=b;
   rs=1;
   rw=0;
   en=1;
   delay();
   en=0;
}

void lcd_string(char *s)
{
   while(*s) {
     dat(*s++);
    }
}

void delay()
{
   unsigned int i;
   for(i=0;i<20000;i++);
}
```

## Working of the project

Port 2 is connected with the LCD display, which is used to show the outputs. Pin 1.0 is acting as an input port, which is connected to LDR. Initially, we made the room in a dark environment. There is no light falling on the LDR. So there is no change which results in less current. When there is no light the order of dark current is larger and resistance is large. Variation of the circuit was shown as no light. Once we are exposing the light on the LDR, there is variation in the resistance which results in light detection. LDR is dependent on the amount of light

intensity falling on it. We have tried with room light but no light was detected, which shows the amount of light intensity plays an important role in the optical detector.

## Problem faced

1. Progisp programmer not found
2. Chip enable error
3. Flash verify error

## Applications

1) Camera Light Meters
2) Clock Radios
3) Nightlights
4) Outdoor Clocks
5) Solar Street Lamps
6) Solar Road Studs

## Video Link

**https://drive.google.com/drive/folders/1zY7P6JN0FRh8Ek0wZ_q9DFRfwZH3TPPb**