ABSTRACT

Project Title: Street light Control Using Atmega328

Smart Street light is an automated system which automates the street. The main aim of Smart Street light is to reduce the power consumption when there are no vehicle movements on the road. The Smart street light will glow with high intensity when there are vehicles on the road otherwise the lights will remain off.

The Smart street light provides a solution for energy saving which is achieved by sensing an approaching vehicle using the Ultrasonic sensors and then switching ON a block of street lights ahead of the vehicle with high intensity. As the vehicle passes by, the trailing lights turn dim automatically. Thus, we save a lot of energy. So, when there are no vehicles on the highway, then all the lights will remain off. It is implemented using Microcontroller.

Detail Requirements

High Level Requirements

ID	Description	Status
HR01	Atmega328	Implemented
HR02	5V Relay Module	Implemented
HR03	Resistor	Implemented
HR04	LDR	Implemented
HR05	Power Supply	Implemented

Low Level Requirements

ID	Description	Status
LR01	Switch	Implemented
LR02	Fuse	Implemented

The project implemented here is one such project where the microcontroller Atmega328 based system automatically controls the street lights**.**
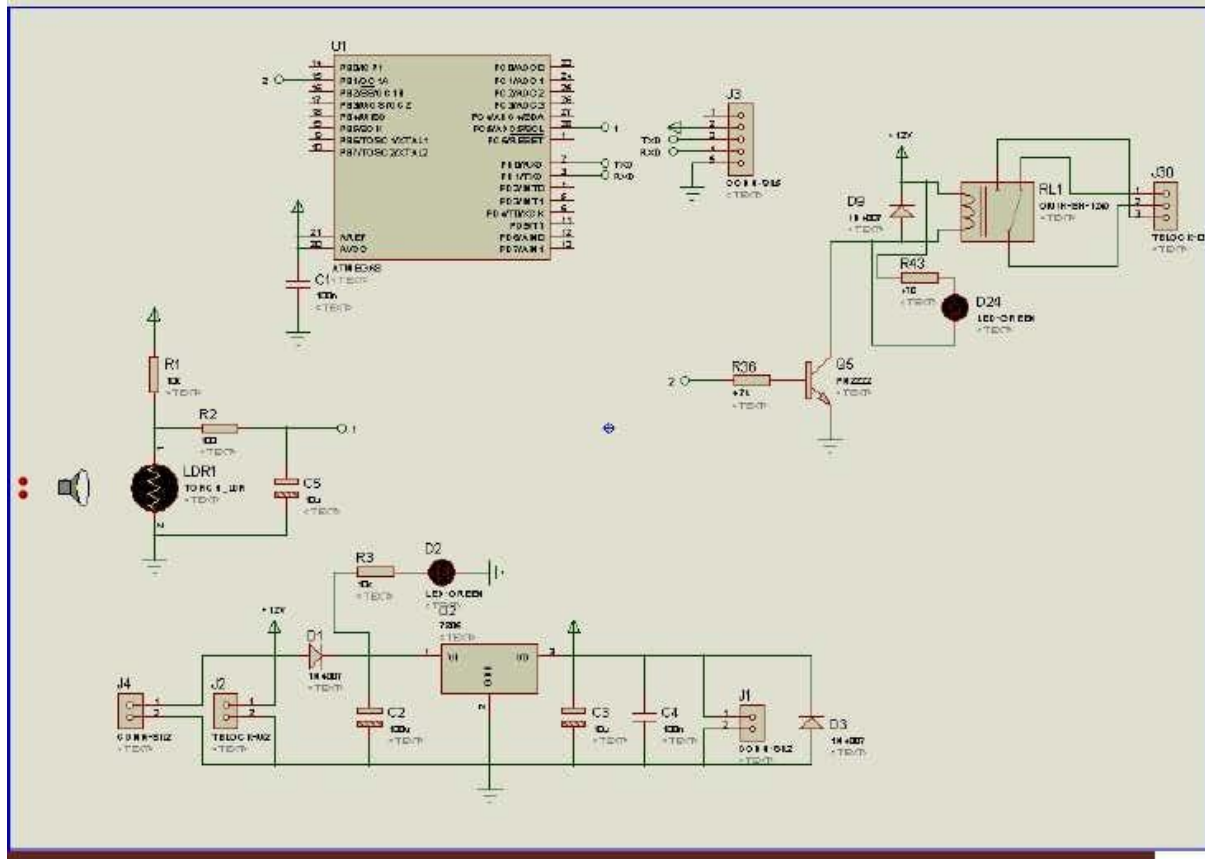
Circuit Description

This is the circuit diagram sketching. We will define this in three part

Part 1: Power input circuit

Part 2: Operation in LDR and Microcontroller.

Part 3: Output of relay.

In this section we came to know that how the parts connected and how they work. The three most important sections will describe through this process. In this circuit diagram we used different electronics parts. They are following: Resistors, Transistor, Capacitors, voltage regulator, LDR, LED, power supply, microcontroller and relay.

BLOCK DIAGRAM

Fig. 1 Block diagram of street light system

Component Description

5V Relay Module

A 5V Relay Module is used in this project which helps 8051 Microcontroller to operate high voltage AC loads like a light. The detailed circuit of the Relay Module is shown in the following image. It consists of a 5V Electromechanical Relay, an Optocoupler IC, transistor, two resistors and two diodes.
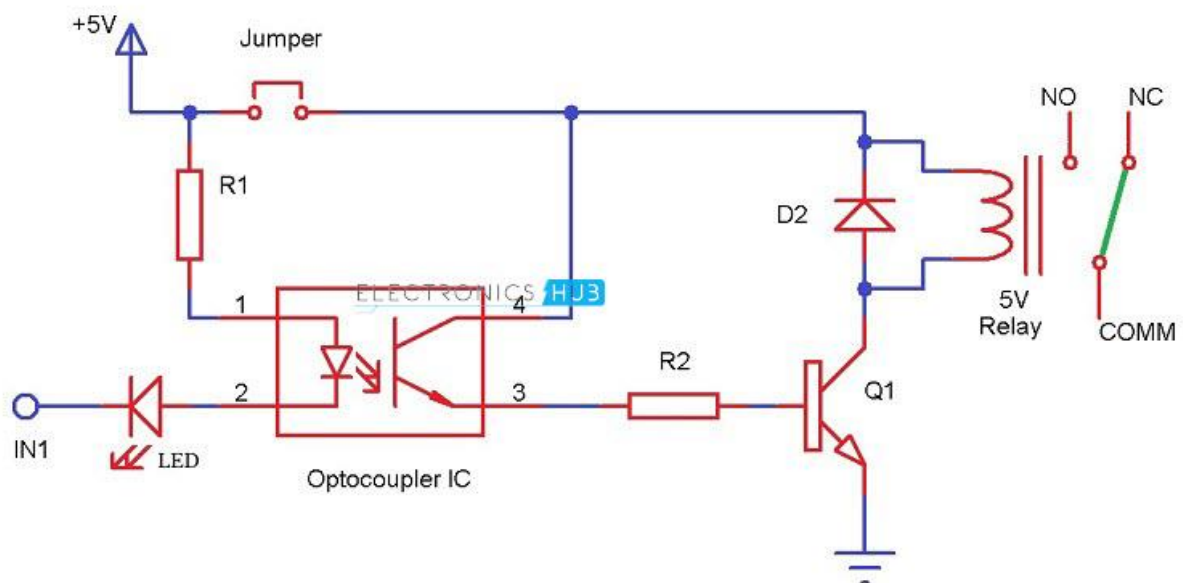
LDRs or Light dependent resistors are very useful especially in light/dark sensorcircuits. Normally the resistance of an LDR is very high, sometimes as high as 1000000 ohms, but when they are illuminated with light resistance drops dramatically. Electronic onto sensorsare the devices that alter their electrical characteristics, in the presences of visible or invisible

light. The best-known devices of this type are the light dependent resistor (LDR), the photodiode and the phototransistors.Light dependent resistors as the name suggests depend on light for the variation of resistance

 LDR are made by depositing a film of cadmium sulphide or cadmium selenide on asubstrate of ceramic containing no or very few free electrons when not illuminated. Thelonger the strip the more the value of resistance.

When light falls on the strip, the resistance decreases. In the absence of light theresistance can be in the order of 10K ohm to 15K ohm and is called the dark resistance.Depending on the exposure of light the resistance can fall down to value of 500ohms. The power ratings are usually smaller and are in the range 50mW to 0.5W. Thoughvery sensitive to light, the switching time is very high and hence cannot be used for highfrequency applications. They are used in chopper amplifiers. Light dependent resistorsare available as disc 0.5cm to 2.5cm. The resistance rises to several Mega ohms underdark conditions.The below figure shows that when the torch is turned on, the resistance of the LDRfalls, allowing current to pass through it .

Metal contact

Cadmium sulphide track

Metal contact

Basic structure of Photoresistor

Symbol

Electronics Coach