

SELF SWITCHING ARDUINO LIGHT USING LDR and LASERS for INDICATION PURPOSES

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Abstract— Automation is the key to the current trends (system) being followed to transform them into a better, faster and reliable technological solutions or systems. Automatic Switch is a gadget that recognizes the nearness of a human in a predefined region and can turn on the lights or any electrical machines that we need. The gadget will consequently kill the lights or electrical apparatus if no one is available in the room/compartment. The mind of the framework is Arduino MEGA which will drive the whole module, sensors, and electrical machines. In the extent of industrialization, automation is a stage past motorization, while automation gave human administrators apparatus to help the clients with the solid prerequisites of work, mechanization fundamentally reduces the prerequisite for human unmistakable and mental necessities too. Computerization plays an essential role on the planet economy and in day by day encounter. Programmed modules are being favored over manual systems.

Keywords: AUTOMATION, ARDUINO, LOGIC BOARD

I. INTRODUCTION

With the advancement of innovation, things are getting to be less complex and less demanding for everybody on the planet today. Robotization is the utilization of control frameworks and data advancements to decrease the requirement for human work in the generation of products and ventures. It is a gadget that recognizes the nearness of a human in a predefined region and can turn on the lights or any electrical apparatuses that we need. The gadget will naturally kill the lights or electrical apparatus if no one is available in the zone.

The mind of the framework is Arduino MEGA which will drive the whole module, sensors, and electrical apparatuses. In the extent of industrialization, computerization is a stage past motorization, though motorization furnished human administrators with

apparatus to help the clients with the strong prerequisites of work, mechanization essentially decreases the necessity for human and mental necessities moreover. Computerization assumes a fundamental part of the economy of the planet and in everyday experience. Programmed frameworks are being favored over manual frameworks.

While motorization gave human administrators apparatus to help the clients with strong prerequisites of work, computerization significantly diminishes the requirement for human tactile and mental necessities also. well.

II. DESIGN

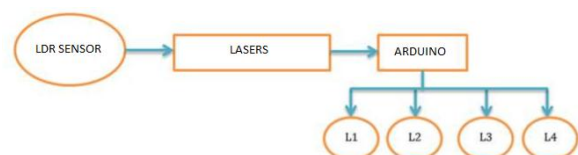


Fig 1: Block diagram of the module

Arduino Mega module contains an Atmega2560 microcontroller, It is an 8-bit microcontroller, which is utilized to control the framework. It's working voltage is 5 volts and has an aggregate of 54 Digital I/O pins. It has a Flash memory of 256 KiloBytes utilized by the bootloader. The fundamental processor is timed at 16 MegaHertz. Figure 1 demonstrates the square graph of the framework. The light Dependent resistor and LASERS both joined to make the sensor. They will recognize the nearness of any individual strolling through them and send an input to Arduino Mega, Arduino will turn on the lights, fans or electrical apparatuses. In the event that there are individuals

inside the room/compartament, then it will not switch off the electrical appliances.

III. COMPONENTS USED

i. Arduino Mega

Fig 2 demonstrates the leading body of the ARDUINO MEGA. It contains Atmega 2560 microcontroller. Atmega 2560 has 256 KB of flash memory for storing code out of which 8 KB is utilized by the bootloader and it has 8 KB of SRAM and 4 KB of EEPROM. Other specifications are shown in Table 1. Board has an operating frequency of 16 Mhz of the microcontroller. A different interface is required to transfer the code on to the microcontroller.

Table 1 Arduino mega 2560 specifications

Microcontroller	Atmega 2560
Board Power Supply	5 Volts
Digital I/O pins	54 (15 provide PWM output)
Input Voltage	7-12 Volts
Input Voltage (limit)	6-20 Volts
Analog Input pins	16
SRAM	8 KB
DC current per I/O pins	20 mA
Flash Memory	256 KB
Clock Speed	16 MHz

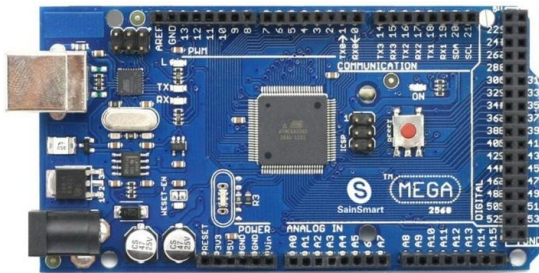


Fig 2: Arduino Mega

ii. LDR Sensor

An LDR is a component shown in Fig 3 that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used as light sensors. The most widely recognized kind of LDR has a protection that falls

with an expansion in the light power falling upon the gadget (as shown in the image above). The resistance of an LDR may typically have the following resistances:

Daylight= 5000Ω

Dark= 20000000Ω

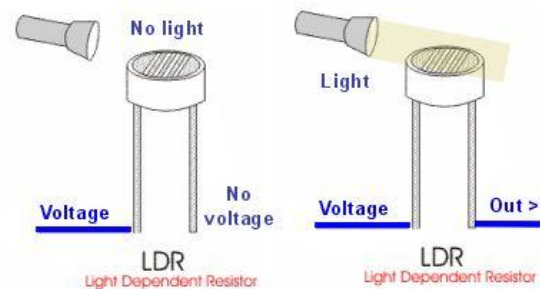


Fig 3: Light Dependent Resistor

iii. LED

A light emitting diode (LED) is a two-lead semiconductor light source. An average LED is shown in Fig 4. It is a p-n intersection diode that emanates light when enacted. At the point when an appropriate voltage is connected to the leads, electrons can recombine with electron openings inside the gadget, discharging vitality as photons.

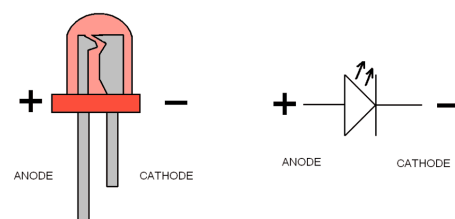


Fig 4: A typical LED diode

iv. LASER

A laser is a gadget that produces light through a procedure of optical intensification in view of the empowered outflow of electromagnetic radiation. The expression "laser" began as an acronym for "light amplification by stimulated emission of radiation".

IV. SOFTWARE

The most recent Arduino 1.8.5 is utilized to program the board, it is an open source IDE that makes it simple to compose, program code and transfer it to the board. It underpins the major working frameworks which incorporate Windows, MAC OS X, and Linux. The environment is programmed based on Java.

V. ARCHITECTURE

The pictorial representation of the model is shown below in Fig 6

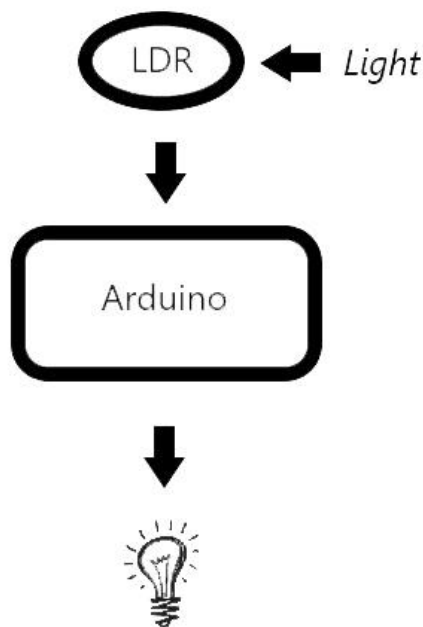


Fig 6: Architecture Diagram

VI. WORKING

The primary supply is given through the power jack. From the Arduino Mega we take 5v supply and associate it to one of the terminals of LDR and opposite end is associated with a resistor of 1k ohm which goes about as a voltage divider and afterward at long last associated with ground. The yield is given by yield pins 10, 11, 12 and 13 of the Arduino which are associated with the driven through a 220ohm resistors. The opposite end of LEDs are grounded.

The Light dependent resistor detects the force of laser light right then and there of time and likewise sends the information to Arduino. The Arduino Mega at that point chooses which LED ought to be glown for the concurring counter esteem.



Fig 7: Initial State

During this stage shown in Fig 7 all the LEDs are turned off, this is a stage where there is no input being given to the microcontroller. Just the power is connected to the entire circuit. The two lasers are turned on, which project their laser beam towards two Light Dependent Resistors. These Light Dependent resistors keep transmitting their variable values to the Arduino board. All the LEDs are connected to 220 kilo ohm resistors while the two Light Dependent Resistors are each connected to 1 kilo ohm resistors. All the components are connected to a common ground terminal which is in turn connected to the ground port of the Arduino board. All the LEDs are connected to digitalWrite ports on the Arduino board, which send in signals to the LEDs with respect to the program.



Fig 8: When count is greater than 0 and less than or equal to 3

When two lasers are cut one after the other, the green and white LED glow at the same time as shown in fig 8. The green LED indicates the count of people inside the room and the white one represents the electrical appliances inside the room. So when there is no one inside, the appliances shut down automatically thus saving power and energy.



Fig 9: When count is greater than 3 and less than or equal to 6

When the lasers are cut more than thrice, the yellow LED glows up as shown in Fig 9 to indicate that there are more than 3 people and less than 7 inside the compartment or room. It also indicates that the room or compartment is half filled.



Fig 10: When count is greater than 6 and less than or equal to 9

When the lasers are cut more than six times, the red LED glows up indicating that the count of the people inside the room or compartment is greater than or equal to seven as shown in Fig 10. It also indicates that the room or compartment is almost filled.



Fig 11: When count is equal to 10 or higher

When all the LEDs on the circuit glow, it indicates that all the seats in the room or compartment are taken up by the people and there are none free. This state indicates that the room or compartment is totally full and there is no more place of other commuters to sit. All the LEDs glow as shown in Fig 11.

VII. CONCLUSION

This Arduino based venture will give a skillful strategy to lighting frameworks and make the entire procedure of vitality sparing less demanding and effective. The lights have been effectively controlled by the microcontroller. With orders from the controller, the lights will consequently turn ON/OFF when there are individuals moving in or out of the compartment or room. A working model of Self-exchanging light utilizing LDR and LASERs for sign reasons for existing was effectively manufactured utilizing Arduino. Use of LDR sensor as the info gives vitality sparing to the framework since LED turn on just when there is a development of individuals, accordingly, the use of energy utilization by LED diminishes.

VIII. REFERENCES

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