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# Design and Implentaion of Cloud Based Light Intensity Monitoring and Control System Using Raspberry Pi

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**Abstract — There are variety of applications for Light Meters for measuring and maintaining adequate light levels such as laboratories, hospitals, schools etc. To maintain healthier and safer environment adequate light levels in the workplace are necessary. Also during summer days, light intensity coming from sun light is too high which has to be controlled for avoiding overheating. This outcomes in keeping up light power. Light force estimation should be possible utilizing distinctive sensors. Generally favoured sensors are LDR and photo diode. In the greater part of the applications estimation of light force is important to keep up required measure of light.**

**Index Terms— Raspberry pi B+ model, HDMI cable, LDR circuit, GPIO**

## I. INTRODUCTION

A considerable lot of the enterprises are troubled with predetermined number of assets and genuine deficiency of specialists on their fields; real time remote checking presents a successful arrangement that limits their end eavors and consumptions to accomplish the craved outcomes inside time. This paper introduces real time remote Light intensity monitoring system using Raspberry Pi which enables the user to track the lighting system remotely. Raspberry pi is a minimal effort ARM controlled Linux based PC which goes about as a server, and it speaks with customers with LAN or outside Wi-Fi module. The key element of this framework is light power being observed promptly and information put away in the database for sometime later, and appeared as dynamic diagrams to the client as per the client necessity in a terminal gadget like Tablet or Smart Phone or any web empowered gadget.
This enables specialists to settle on right choices at opportune time to get sought outcomes

To guarantee wellbeing out and about, movement lights should be plainly obvious for street clients. The light force must be adequate under each (climate) condition, which set in legitimate principles. Throughout time, the iridescent force of activity lights gradually diminishes. Conceivable reasons are contamination of focal points or reflectors, maturing of the light source or individual LED failure. Remote observing empowers the street specialist to do opportune administrations, in a manner that activity lights keep satisfying the statutory guidelines for ideal movement wellbeing.

## II. RELATED WORK

**Block Daigram:**

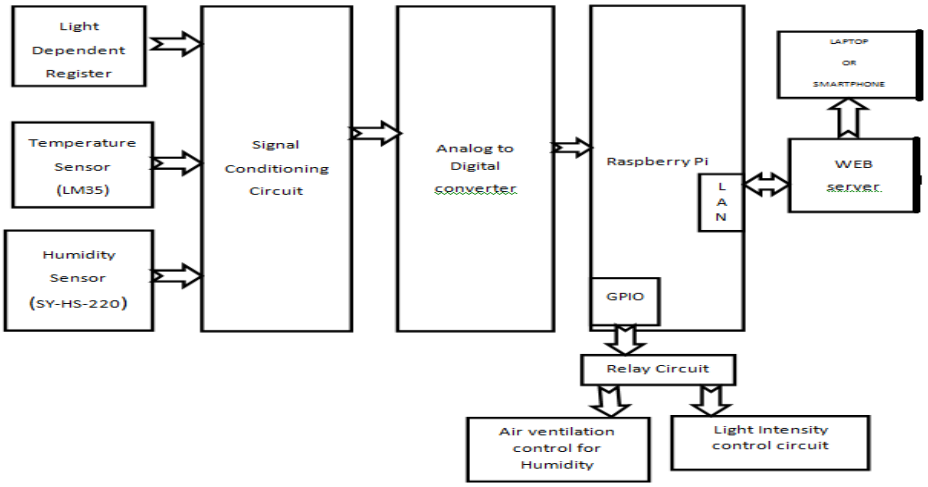


Figure 1: Block Diagram of proposed system

**Procedure:**

1. Connect ADC circuit to LDR circuit and raspberry pi using cables.
2. Connect Raspberry pi to screen utilizing HDMI link.
3. Plug the power cable to raspberry pi to turn on device.
4. Subsequent to turning on raspberry pi the working framework will begin booting and it will appear on screen.
5. After complete the booting of raspberry pi we will get the initial desktop screen of Raspberry pi.
6. Open command window.
7. Type in command window 'sudosu'
8. Open drive where you store the program file. Using 'cd' command.
9. After opening drive write 'python file name.py' because the program should be done in python language we get '.py' extension for program file. Therefore run this file we first write python.
10. Then you'll see the readings which are from LDR. You can see the progressions of readings according to light power change.
11. For stop program execution press ctrl + z. The execution of program will stop.

### Raspberry Pi

The raspberry Pi board is connected to Humidity, Light measurement and control circuits. By gathering all data it uploads to Cloud based server from which the data is accessible to user via wireless internet connection to cloud from smart phone or tablet. We can store Acquire in the database, created web application put away in the server. Customer can get to the framework with IP address through PC or Smartphone or Tablet or whatever other web empowered gadget.

### Light sensor

Light Dependent Resistor (LDR) is utilized as light sensor. LDR is a resistor whose resistance diminishes with expanding occurrence light power. It is made of a high resistance semiconductor. In the event that light falling on the gadget is of sufficiently high recurrence, photons consumed by the semiconductor give bound electrons enough vitality to bounce into the conduction band. The subsequent free electron (and its gap accomplice) direct power, accordingly bringing down resistance.

### Interfacing Connectors

### GPIO:

- General-reason input/yield (GPIO) is a non specific stick on an incorporated circuit whose conduct, including whether it is an information or yield stick, can be controlled by the client at run time.
- GPIO pins can be designed to be information or yield.

- GPIO pins can be empowered/incapacitated .
- Input qualities are decipherable (commonly high=1, low=0) .
- Output qualities are writable/comprehensible.
- Input qualities can regularly be utilized as IRQs (normally for wakeup occasions) .
- GPIO voltage levels are 3.3 V and are not 5 V tolerant.

**HDMI cable:**

An HDMI- or composite video-capable television or monitor**:**

An HDMI-capable monitor because it offers better resolution and built-in sound. You can utilize simple in the event that you need, be that as it may. A HDMI link to interface Raspberry Pi to screen.

## III. RESULTS

As per above methodology experiment conducted and got following results

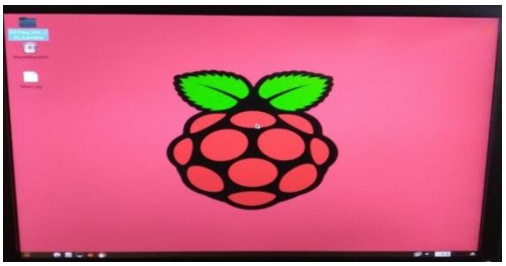

***Figure 2 Initial display of Raspberry Pi***

Above figure shows the first screen after starting Raspberry Pi project.

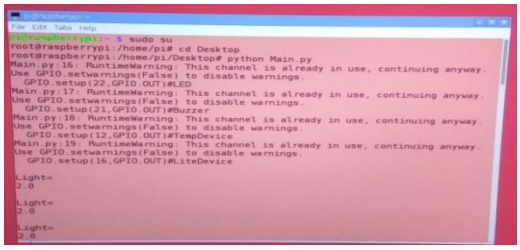


***Figure 3 Project command window***

Above figure shows light sensor program run in command window.


***Figure 4 Reading before light projecting on LDR***

As see in above these are readings before light projecting on LDR.

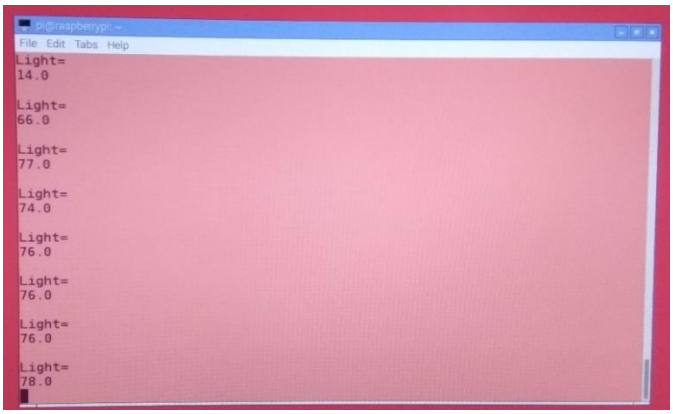


***Figure 5 Readings after light projecting light on LDR***

Above figure shows the resistance of LDR changes after light projection.

| Reading no. | Light intensity ( lux ) | Light distance from LDR (cm) |
|---|---|---|
| 1 | 2.0 | Initial |
| 2 | 14.0 | 1.5 |
| 3 | 66.0 | 1 |
| 4 | 78.0 | 0.5 |

Table 1. Reading of light intensity after projection light

## IV. CONCLUSION

As per the result it shows that LDR is a resistor whose resistance decreases with increasing incident light intensity. The readings of LDR displayed successfully on Raspberry Pi.

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