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Automatic Light Controller for Laboratory

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ABSTRACT

In today's life, because of increasing social activities, folks need reliable lighting throughout all hours of the day and night. Due to the constraints and rising price of electricity production, it's changing into progressively necessary to direct bigger efforts into optimizing electricity utilization. LIGHT MANAGEMENT SYSTEM is essentially a comprehensive automation system of lighting control based on Occupancy/daylight. Lighting Management System includes lighting control and goes further to monitor the lighting status in aElectronic Product And Innovationcentre and also facilitate interface with this utility aspect of the lab. The key features of the proposed system are to deliver a truly intelligent laboratory responding to the specific lighting need based on occupancy, functionality and available daylight. We also aim to include features likes Sleep mode, Day mode, etc that will be controlled manually by an android app through a Bluetooth interface and which will cover the SMART characteristic of the title.

1. INTRODUCTION

Considering the matter statement we tend to area unit developing a wise research lab, that is additional or less associated with the good HOME technology. good house is Associate in Nursing rising thought that pulls the activity of many areas of science and engineering. good house is the term ordinarily wont to outline a residence that integrates technology and services through home networking to boost power potency and improve the standard of living.

The idea is to make Associate in Nursing expeditiously good and automatic model that may detect/sense the presence of individuals within the lab and manufacture needed output. The output therefore generated is within the kind of a LED/bulb to be turned ON/OFF relying upon the realm within which an individual is functioning on the pc. to form it good, efforts are going to be created to feature many modes within the system that may be handled manually by Associate in Nursing robot phone through Bluetooth signal. The modes therefore contain Day Mode, Night Mode, Sleep Mode, Movie mode, Party Mode, etc. to boot, we tend to will sense the external issue and therefore monitor the system consistent with it. The external issue that may be monitored within the system is that the daylight intensity that's touching the physical atmosphere of the research lab.

The typical user wants totally different light-weight intensities in several places. generally the sunshine intensity from outside is spare, and therefore we do not have to be compelled to activate any light-weight. However generally the user leaves however forgets to show OFF the sunshine. These factors cause energy waste. So some power management of sunshine management during a house is necessary so as to save lots of energy.

Another main purpose is to supply visual comfort to the prevailing users of the system with relevance the external factors touching the sunshine within the research lab.

2. LITERATURE SURVEY

Smart light-weight property has been enforced exploitation varied techniques in varied forms. In some implementation, microcontroller 8051 has been used as a significant element whereas in another implementation technique HYDRA microcontroller has been used. Each of them offer equal potency and ease to use. Sensible light-weight property interface has been enforced

Smart appliance is AN interface between the remote with its mobile or remote and a home reliever. for every device, so as to accomplish this interface style method was taken victimisation the small manage mental and Arduino for dominant some application within the home manually by victimisation foreign control and mechanically through totally different sensors[1].Smart Home Security

Systems may be straightforward and compact security warning device to shield your home/shop and valuables. The integral passive infrared detector detects human movement by sensing temperature changes over the scene, and works even within the dark. organic structure heat moving across the scene can trigger the PIR detector, and also the trigger signal are going to be sent to the negative feedback circuit instantly. Because the output of the warning device may be connected to external lamps[1]. Sensible Home Temperature Sensing System for cooling system we have a tendency to can management the house temperature mechanically by employing a special temperature detect or that is that the LM35 detectors employed. it's Associate in Nursing output voltage that's proportional to the Celsius temperature[1].

The Home automation system that uses Wi-Fi technology [5]. System consists of 3 main components; internet server, that presents system core that controls, and monitors users' home and hardware interface module (Arduino PCB (ready-made), Wi-Fi defend PCB, three input alarms PCB, and three output actuators PCB.), that provides acceptable interface to sensors and mechanism of home automation system. The System is best from the measurability and suppleness purpose of read than the commercially accessible home automation systems. The User might use an equivalent technology to login to the server internet based mostly application. .If server is connected to the web, thus remote users will access server internet based mostly application through the web exploitation compatible application[2].

3. PROPOSED METHODOLOGY

Scope of implementation: The planned system is enforced in additional than one ways that. we'll discuss every of them thoroughly. The terribly initial mode of implementation is that the one that's associated with the title of the project: Automatic i.e. on the premise of Occupancy. The Second mode is that the one that enables the interface of the system with the external factors poignant the natural intensity of the light: Intensity management supported daylight intensity.

The Third mode is that the sensible Mode. This mode can embrace dominant the system exploitation AN mechanical man application. The mechanical man application can add on the options like Day mode, Sleep Mode, Party mode and moving picture mode.

Components used are:

Hardware requirements

1. HYDRA microcontroller.
2. Bluetooth module(HC05)
3. IR Sensor.
4. LDR
5. LED lamps.

Software Requirements

1. Android studio.
2. Gnu ARM tool
3. Mingw.
4. Flash Magic
5. Eclipse IDE.
6. XCTU.

Advantages:

- Allows the user to work at varied modes.
- The system operates at NO or terribly less power provide.
- It serves a pair of functions at a similar time i.e. visual comfort and energy saving.
- The system is controlled remotely exploitation AN mechanical man application.

Disadvantage:

- The system is operated exploitation mechanical man application as long because the device connected to the Bluetooth is at intervals the vary of the system.
- The energy saving isn't continuous.

Assumptions:

- It is clearly assumed that the system can either work mechanically or exploitation AN mechanical man app i.e. manually.

Fig. 1 Component Block Diagram of the System.

1. HYDRA microcontroller: Hydra may be a feature made development board battery-powered by ARM Cortex-M3 primarily based LPC1768 microcontroller. The standard style makes it appropriate for any embedded and AI application. It's appropriate for beginner, intermediate and advanced embedded developers.

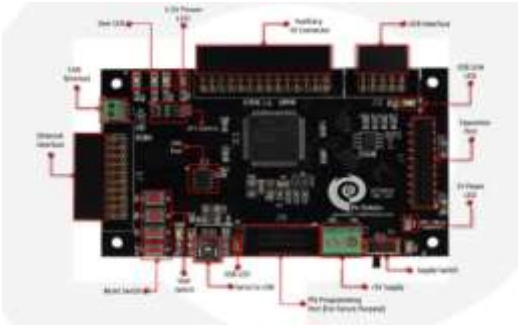

Fig.2 HYDRA microcontroller

Specifications
• LPC1768 package: LQFP100
•Offer voltage: 5V
• Power offer options: USB battery-powered or external power offer
• On-board crystal frequency: twelvemegacycle per second
• RTC crystal frequency: thirty two.76KHz
• RTC battery voltage: 3V.

- **Bluetooth module**-HC05.
  The Bluetooth module can transfer thedata generated by the
  Arduino board to the robot phone.
  FEATURES OF HC 05 Bluetooth module:
  1) Easy touse.
  2) Serial port protocol module.
  3) Designed for wireless serial affiliation setup.
  4) 3 Mbps modulation with complete two.4 gigahertz radio transceiver.
  5) As little as twelve.7mmx27mm
  6) Low power operation one.8V
- Android sensible Phone.
  To control sensibleoptions of the system.
- Lamps/LEDs
  Used to manufacture output.
- IR Sensors
  To sense the occupancy within the workplace.
  It is associatedegree electronic device that liveactinicradiationdivergentfrom object in its field of read.
  Used for motion detection.
  • LDR
  To sense thedaylight intensity outside the workplace.
  • Connecting wires
  To make affiliation between varied electrical parts.

5. RESULT

Implementation

Physical model assembly :

- Buying of components
- Assembling the parts
- Checking for proper physical assembly

Electrical connections:

- Buying the components
- Making electrical connections
- Checking for proper connections

Programming:

- Installing the software(Arduino, android studio)
- Coding the microcontroller to work as desired
- Making the android app
- Interfacing the phone with the Arduino

Checking the system working

6. CONCLUSION

In this content the look and implementation of management and monitor system for automatic lightweight management has been established. good lightweight property is controlled by Microcontroller computer code and sensors as a dominant system. The system is connected to a wireless Bluetooth technique to watch and management the sunshine instrumentation from anyplace within the neighbourhood victimisation each Arduino and small controller.Based on surveyed study the comparison automation systems square measuregiven. Microcontroller, computer program, a communication interface and their performance issuesquare measure compared. There square measurevariety of homemade (DIY) platforms on the market that permitto make Automation system quickly and simply with low price and high performance e.g. Raspberry pi, Arduino, alternative microcontrollers, etc. In future automation canadditionalsensible and quick. it might be extended to the largescale atmospherelikeschools, offices and factories etc

7. REFERENCE

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