

Implementation of Real time based Automated Lighting Control System

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Abstract: The plan and usage of one of a kind detecting and in citation application is introduced here. To enhance and spare vitality inside the city, brilliant stop lighting has the potential. Despite regardless of whether a client is available, standard stop lights stay lit all through night, which causes pointless vitality wastage. These stop lights can be fitted with a mechanized lighting framework. To distinguish when the clients are on the way robotized framework utilizes movement sensors. The robotized framework turns the light on when clients are available, and kills the light generally. The fundamental goal of this venture is to grow long haul robotized control framework model for the city's way lights and to test it in a city's stop. The robotized framework needs to keep up the well being of the way voyagers while sparing vitality. Likewise, the establishment and framework should be of low cost. PIR (Passive infrared) sensors are utilized as a part of computerized lighting framework they are situated on each post to distinguish clients on way. The control rationale of perusing the sensors and deciding when the light is turned on or off and when to remotely advise neighboring posts to turn on, all these are taken care of by Renesas microcontroller. Except if movement is distinguished once more, lights stay on for a predetermined time out period. The quantity of neighboring shafts that turn on after the movement is identified and time out period these parameters are arranged remotely through a workstation associated with a remote handset. To guarantee adequate lighting is given to meet client wellbeing needs these parameters are completely tried. The last deliverable is a reproducible robotized lighting model with remotely configurable parameters introduced in a recreation center.

Keywords: Automated lighting, Safety, Sensors, Wireless

I. INTRODUCTION

Consequently turning park lights off when there are no clients present will altogether diminish the measure of vitality devoured by the lights. Diminishing the measure of vitality squandered by city parks is valuable to nature and lessens costs for the city. The mechanized lighting framework utilizes inactive infrared (PIR) sensors situated on each light post to identify clients on the way. A microcontroller handles the control rationale of perusing the sensor and deciding when a light is turned on or off and when to remotely advise neighboring shafts to turn on. The lights stay on for a predefined timeout period except if movement is identified once more. Parameters, for example, the timeout period and the quantity of neighboring posts that turn on after movement is recognized are remotely configurable by means of a PC associated with remote handsets. These parameters will be completely tried to guarantee adequate lighting is given to meet client well being needs. The proposed task of controlling road light framework can upgrade administration and effectiveness of road lighting frameworks. It utilizes Renesas microcontroller and GSM based remote gadgets which empower more productive road light framework administration. Lighting frameworks, particularly in the general population area, are as yet outlined by the old guidelines of dependability and they regularly don't exploit the most recent innovative advancements. Here in this undertaking controls the entire activity by controller, GSM and a few sensors. This undertaking permits huge cost investment funds and a more noteworthy regard for the earth. The square outline of mechanized lighting framework as appeared in Fig 1 comprises of Renesas microcontroller, LCD, LDR, PIR sensor, LED strip, GSM. The microcontroller situated at the focal point of the square outline frames the control unit of the whole task. Inserted inside the microcontroller is a program that causes the microcontroller to make a move in view of the sources of info gave by the yield of the sensors. The PIR sensors distinguish the latent movement of the body inside the place and send the flag to the Renesas small scale controller for the examination. The smaller scale controller will process the information and takes the further activities. The LCD show is given the controller for the investigation of the interior tasks about the present advance of activities. Here all the electronic parts are controlled by Micro Controller, which is heart of the undertaking. Here in this task we are making consequently turn on the LED lights in night by utilizing LDR daylight sensor. Essentially LDR is a light ward resistor which changes its esteem relies upon the light. By utilizing microcontroller we are making this task. The LED lights are controlling by the LED driver circuit. Here another

sensor is utilizing to detect the development of individuals, agreeing on this sensors yield the controller turn on the LED lights. On the off chance that any LED lights are not divert on in the wake of getting yields from the sensor then the controller crosschecks the lights by another LDR sensor, which is put close to Lamp and sends the data through GSM (remote association) to the Android portable for encourage task. In this task we can process the activity by physically too. It is just utilizing when the lights are required in multi day, likewise then we can make this task. Here LCD is utilizing to show the data of the task. At whatever point the inactive movement of the body is identified, the PIR sensor sends to the flag to the controller, the controller will turn on the light to encourage the general population. There are circumstances like, both the shafts are not working appropriately, at that point the controller will recognize the issue and sent the data to the approved client for the further activity.

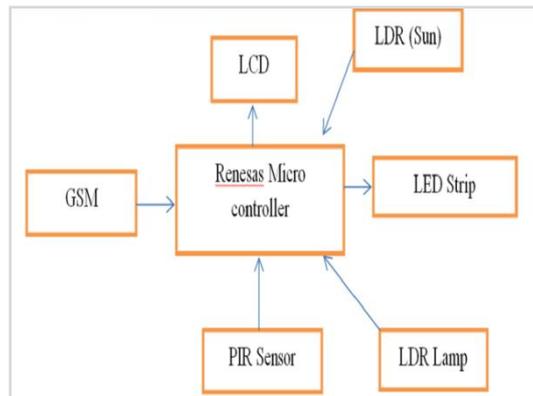


Fig1: Block diagram of automated lighting system

II. LITERATURE SURVEY

Vehicle motion is detected using sensor and the street light glows; this system uses the recent technology of the sources of light i.e LED lamps. This system has been proposed by S.Sanjay [12]. This framework is likewise used to direct the exchanging of road light naturally as per the light force.

Contingent upon vehicle developments, a road lightning framework has been proposed by K.Shantha[13] relying upon the shine and shadowiness calculation and power of light, the framework works in the programmed mode which controls the road light. According to shifting season the control of the road light should be possible appropriately. To moderate greater power and power cut out capacity and a programmed control design are incorporated .PIC microcontroller was utilized to execute this venture.

ZigBee based Remote Control Automatic Street Light System has been proposed by Srikanth [14] .ZigBee modules is utilized to outline this framework, which recognizes the flawed lights and furthermore controls the light .Intelligent framework which takes programmed choices of ON, OFF and DIMMING while at the same time thinking about the vehicle development and person on foot and encompassing condition is likewise talked about. Living and non-living things development is recognized utilizing PIR sensor.

In the year 2015 M.Abhishek [15] has proposed the outline of activity stream based road light control framework which adequately uses the sun based vitality. Sustainable assets i.e. sun oriented vitality is utilized for road lighting. 8052 microcontroller is utilized for this system.Instead of ordinary knobs; LEDs are utilized as a result of which three times the power utilization is decreased. Here the Sensors detect the vehicle development which are put on either side of the street and sends the summons to the microcontroller to turn ON and OFF the lights. Just when the vehicle development is detected road lights will sparkle or else road lights will be turned off. Lights will be turned off in the night due to the microcontroller.

Self following framework has been incorporated into the road light framework which will build the transformation effectiveness of the sunlight based power age, this framework has been proposed by C.Bhuvaneshwari [16]. Detecting gadget utilized here is the sun GPS beacon, position of the sun at each moment will be detected, in view of the light thickness of the sun; the yield of the speaker will be gotten. LDR is utilized as sun following sensor, LDR signs will be increased by the speaker and low level flag will be changed over to abnormal state signals and the yield will be given to the comparator. The speaker utilized here is LM324 IC comparison of the signs will be finished by the Comparator and the charge will be sent to the 8051 microcontroller.

Photovoltaic (PV) road framework utilizing three unique lights and its examination has been proposed by SomchaiHiranvarodom [18]. Low weight sodium light, high weight sodium light and a fluorescent light these three lights have been utilized for establishment in each rustic region of Thailand.

III. PROBLEM DEFINITION

The objective of this undertaking is to build up a long haul mechanized lighting model and test it in broad daylight places and stops. The mechanized lighting framework must keep on having the first usefulness of lighting the way for stop clients. The framework must moderate vitality by turning lights off when nobody is on the way, and naturally turn the lights on when it detects clients are available. The clients' security must be kept up via computerized framework. Client needs incorporate lighting the way sufficiently far in front of and behind the client, and keeping the lights on while the client is on the way. Walkers, sprinters, and cyclists are the distinctive clients included here.

IV. METHODOLOGY

Initially block diagram of the automated system is designed and in the next step hardware is tested according to the block diagram. Code is written in Embedded C language, and then the logic is developed according to the project. Finally testing of the project is done according to the conditions. Methodology is as shown in fig.2.

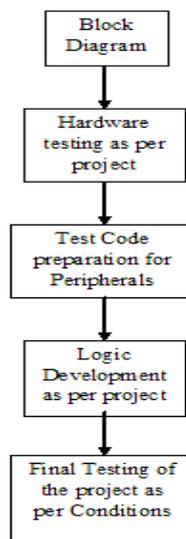


Fig.2: Methodology of the Automated Lighting Control System

V. AUTOMATED LIGHTING FRAMEWORK CIRCUIT OUTLINE

The framework fundamentally comprises of LDR, PIR sensor, control supply and renesas Microcontroller.

LDR: The LDR is utilized as haziness indicator in this circuit. LDR is a resistor as appeared in Fig 2, and its opposition differs as indicated by the measure of light falling on its surface. The obstruction of LDR diminishes when LDR identifies light, along these lines on the off chance that it recognizes obscurity its obstruction will increment.

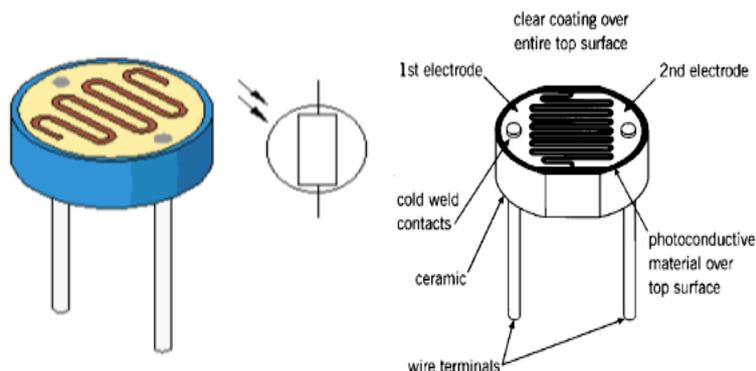


Fig 3: LDR

PIR SENSOR: A detached infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light emanating from objects in its field of view. The PIR sensor is as appeared in Fig. 3



Fig 4: PIR sensor

Regulated power supply: Normally we begin with an unregulated power supply running from 9 volt to 12 volt DC. To make 5V power supply KA8705 voltage controller IC as appeared in Fig 4 has been utilized.

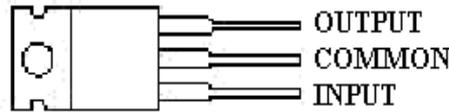
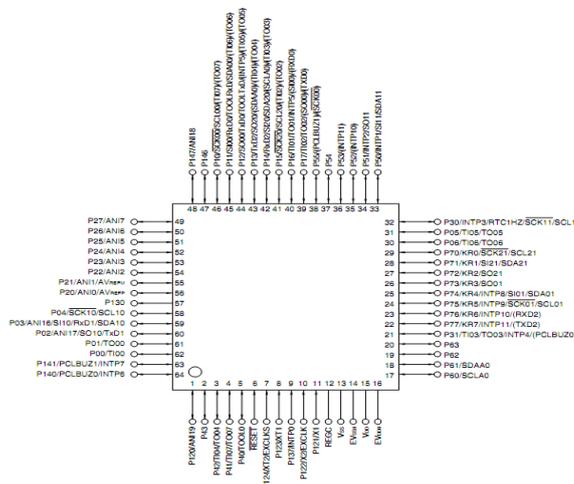


Fig 5: Power supply regulator

KA8705 is easy to utilize. Basically associate the positive lead from the unregulated DC supply to the information stick, interface the negative prompt the normal stick and after that turn on the power a 5V from the yield stick will be acquired.

Renesas Microcontroller: Renesas microcontroller outflanks its predecessor i.e. 8051 gathering of microcontrollers, with various in-created features. Perhaps a few the various features are portrayed here. Renesas is a 16 bit microcontroller, Minimum bearing time can be changed from ultra-low speed (30.5us) to quick (0.03125us), 16 to 512KB of ROM and 2 to 32KB of RAM are open depending on the game plan and number of pins, On-chip quick (32 MHz to 1 MHz) too a low-speed (15 KHz) oscillator is present, 10 bit assurance A/D converter (6 to 26 channels dependent upon the series), Totally 3 UART for Serial Interface, Totally 0-7 channels for check with worked in PWM features, Most of the pins of Renesas have multi-errand features, Cost of Renesas microcontroller is likewise less, Rigid gathering of microcontroller consequently less slanted to hurts in view of electrostatic charge, Operates with 5v control supply. Stick outline of Renesas microcontroller is showed up in Fig 5.



likewise called "content informing"), which is presently upheld on other portable norms too. Another favorable position is that the standard incorporates one overall Emergency phone number; this makes it simpler for worldwide voyagers to associate with crisis administrations without knowing the neighborhood crisis number. In 1982, the European Conference of Postal and Telecommunications Administrations (CEPT) made the Groupe Special Mobile (GSM) to build up a standard for a cell phone framework that could be utilized crosswise over Europe in 1987.

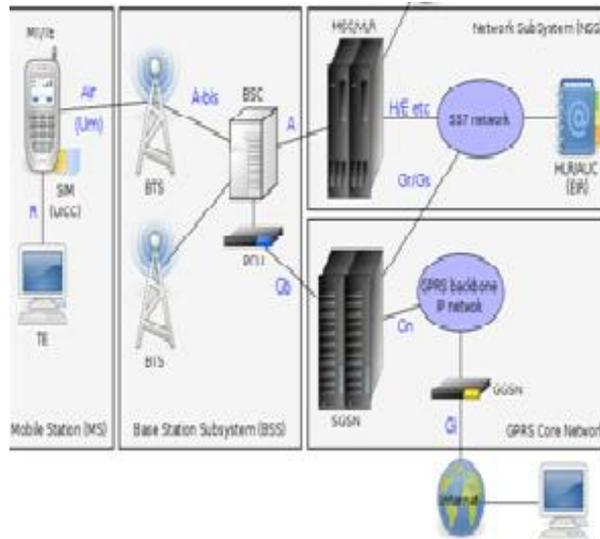


Fig 7: GSM.

VI. AUTOMATED LIGHTING CIRCUIT DIAGRAM

Automated system consists of the following blocks

- 1) GSM: The model name of GSM is SIM800C. It is used to send the messages.
- 2) PIR Sensor: it is used to detect human motion.
- 3) RENESAS MICROCONTROLLER: It is used to control all the blocks of the automated system.
- 4) LED BULBS: Bulb1 is used to indicate the human motion, Bulb2 is used to indicate the day and night mode. It will be on according to the conditions.
- 5) RELAYS: Two relays are used to control the LED bulbs.
- 6) LDR: LDR will glow the bulbs according to the conditions.

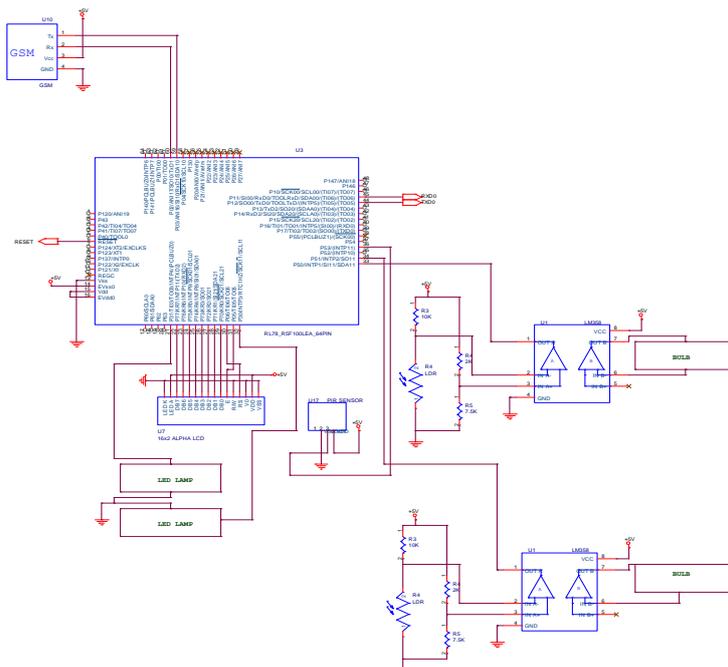


Fig 8: Schematic of the automated lighting control system

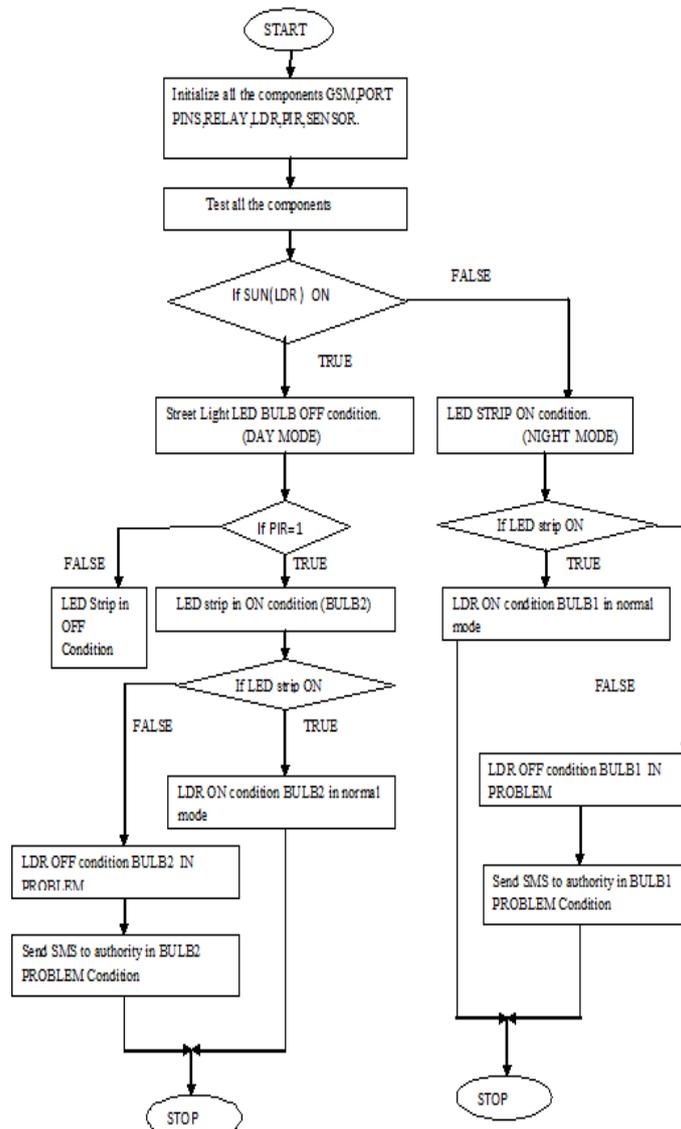


Fig 9: Flow Chart of the automated lighting control system

VII. RESULTS AND DISCUSSIONS

The task point was to decrease the reactions of the present road light framework, and an answer for spare power. In this undertaking the primary activity, is to set up the sources of information and road. The model as appeared in fig 10 has been executed and fills in not surprisingly and yields of the framework to control the lights of the will end up being extremely valuable and will satisfy all the present limitations if actualized on a huge scale.

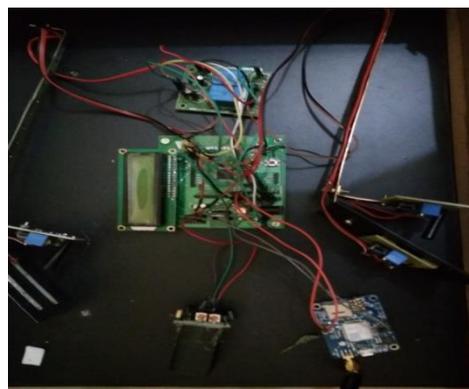


Fig10: Prototype of the automated lighting Control system

VIII. CONCLUSION

In this project design and construction of automatic street light control system circuit has been described. Circuit is designed such that it switches the lamps accurately. LDR sensor is the main sensing component used in the circuit. According to the program which satisfies certain conditions lamps will turn on. Controlling all the components of the design is done by RENESAS microcontroller. Circuit design will sense the human motion and it switch OFF the bulbs when no motion is detected. If the LDR is not in good condition the message will be sent to authority. Two modes are used in this project, day and night modes, if day mode is detected bulbs will be in OFF condition and if night mode is detected bulbs will be in ON condition. It can be used in many applications, in college's schools and industries.

FUTURE SCOPE

The above venture, we can create sun oriented road light framework with Automatic road light controller. The framework can be controlled from a battery, which can be charged amid day time by gathering the sun powered vitality through a sun oriented cell. The sun oriented vitality reaped from daylight can be put away, transformed from DC voltages to AC voltage utilizing sun tie converter.

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