SMART STREET LIGHTINING SYSTEM USING INTERNET OF THINGS

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Abstract -*The main aim of smart street light systems is that lights turn on when needed and light turn off when not needed. Moreover, the smart street light system in this paper behaves like usual street lights that turn on all night. The ideal behavior of the smart street light system is that no one finds turn-off of street lights at night. Whenever someone see street lights, they turn on and whenever no one see street lights, they turn off. The smart street light system consists of LED lights, brightness sensors, motion sensors and short-distance communication networks. The whole world, enormous electric energy is consumed by the street lights, which are automatically, turn on when it becomes dark and automatically turn off when it becomes bright. It will indicate us through message how much electricity is being consumed by each and every led lights in the system.*

Key Words:*Light,LED,IoT ,IR,LDR*

1. INTRODUCTION

Now a days electricity is most important thing in the human life. so, much of Electricity is wasted by human beings through switch on street lights by the whole day. To increase its efficiency when in use. so,we introduce sensor based street lights. The main use of this project is to save electric city. The main aim of smart street light systems is that lights turn on when needed and light turns off when not needed. On of the main aim this project is whenever climate become cloud then lights will automatically switch on

II.LITERATURE SURVEY

S.Suganya et al [2] have proposed about Street Light Glow on detecting vehicle movement using sensor is a system that utilizes the latest technology for sources of light as LED lamps. It is also used to control the switching of street light automatically according to the light intensity to develop flow based dynamic control statistics using infrared detection technology and maintain wireless communication among lamppost and control terminal using ZigBee Wireless protocol. It also combines various technologies: a timer, a statistics of traffic flow magnitude, photodiodes, LED, power transistors

K.Santha et al [3] have surveyed on Street Lighting System Based on Vehicle Movements. The system operates in the automatic mode which regulates the streetlight according to brightness and dimness algorithm and light intensity. The control can be made according to the seasonal variation. It includes a time cut-out function and an automatic control pattern for conserving more electricity. The whole project was implemented using a PIC microcontroller.

III.METHODOLOGY

The Smart street light control system adopts a dynamic control methodology. According to the proposed plan, initially when it becomes dark, The lights will automatically turn on. When it becomes morning lights will automatically switch off. But, in this whenever the vehicle or any object passes through the light then the light becomes bright. Whenever the object passes away from the light ,the light will became lighter. The advance technology in this system it will calculate the total power consumption the LED lights.

3.1 EXISTING SYSTEM:

Industry of street lighting systems are growing rapidly and going to complex with rapid growth of industry and cities. Automation, Power consumption and Cost Effectiveness are the important Considerations in the present field of electronics and electrical related technologies. To control and maintain complex street lighting system more economically, various street light control systems are developed. These systems are developed to control and reduce energy consumption of a town's public lighting system using different technologies. The existing work is done using HID lamps. Currently, the HID is used for urban street light based on principle of gas discharge, thus the intensity is not controlled

by any voltage reduction method as the discharge path is broken. HID lamps [10] are a type of electrical gas discharge lamp which produces light by means of an electric arc between tungsten electrodes housed inside a translucent or transparent fused quartz or fused alumina arc tube. This tube is filled with both gas and metal salts. The gas facilitates the arc's initial strike. Once the arc is started, it heats and evaporates the metal salts forming plasma, which greatly increases the intensity of light produced by the arc and reduces its power consumption. High-intensity discharge lamps are a type of arc lamp. Disadvantages of Existing System: HID lamps consume more power. The life time of the HID lamps is very less. It cannot be used in all outdoor applications. Brightness of the lights in the rear view mirrors which causes a problem for drivers in front of your vehicle.

3.2 PROPOSING SYSTEM:

 Since the HID lamps are not cost effective and not reliable, smart street light system has overcome by replacing the HID lamps with LED. Due to automation, power consumption and cost effectiveness in the present field of electronics and electrical related technologies, industry of street lighting systems are growing rapidly and going to complex with rapid growth of industry and cities.

The LED are less cost and long duration life capacity.so I used LED in my system. In my system whenever the climate will become dark then the lights will automatically turn on using ir sensor. The object or vehicle or human being passes through the IR sensor the light will became with high density of light, the object passes away the sensor then the light will became the low density light.so this will not cause for vehicle accident. Because the will not permanently switch off it became to low density only.

One of the major advantage in my project .it will automatically calculate the total power consumed by lights .and It will sends the message to the user mobile phone with the help of the SIM800L hardware tool kit

IV MAJOR COMPONENTS
4.1 ARDUINO UNO
Arduino Uno R3[11] specifications are ATmega328 microcontroller, operating voltage at 5v, input voltage 7 to 12v, input voltage limit up to 20v, digital

I/O pins 14, analog pins 6, DC current 40mA, flash memory 32KB including 0.5KB used by boot loader. SRAM of 2KB, EEPROM of 1KB and clock speed of 16 MHz some of the Features of Arduino UNO are power: can be USB connection or external power supply, with 7 to 12 volts recommended. The Arduino UNO provides power pins for other devices, the variants are 5v 3.3v and vin IOREF pin for optional power. Arduino Uno is a 2KB of SRAM and 1KB of EEPROM (Electrically Erasable Programmable Read Only Memory). There are various input and output pins where 14 of them are digital pins with serial transfer and external interrupts and PWM (Pulse   Width   Modulation)   pins
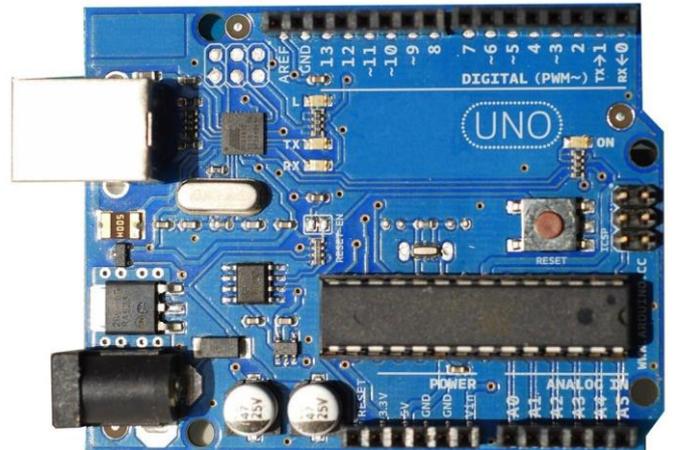
and 6 analog pins. Arduino differs from all the preceding boards which does not use the FTDI USB-to-serial driver chip.

4.2 INFRARED SENSOR

An infrared sensor [12] is an electronic device that emits in order to sense some aspects of the surroundings. An IR sensor can measure the heat of an object as well as detects the motion. These types of sensors measures only infrared radiation, rather than emitting it that is called as a passive IR sensor. Usually in the infrared spectrum, all the objects radiate some form of thermal radiations. These types of radiations are invisible to our eyes that can be detected by an infrared sensor. The emitter is simply an IR LED and the detector is simply an IR photodiode which is sensitive to IR light of the same wavelength as that emitted by the IR LED. When IR light falls on the photodiode. The resistances and these output voltages, change in proportion to the magnitude of the IR light received.

4.3 **SIM 800L**

SIM800L is a quad-band GSM/GPRS module, that works on frequencies GSM850MHz, EGSM900MHz, DSC1800Mhz and PCS1900MH00L features GPRS multi-slot class 12 / class 10 (optional) and supports the GPRS coding schemes CS-1, CS-2, CS-3 and CS-4

V. WORKING PROCEDURE

The working procedure of the Smart street light using IR sensors is explained below. The following are the different steps included in building a Smart street light.

1. LDR pin 1 is connected to A0 (analog) port of uino Ard2. Connect al**Uno board.**

l the IR sensors to port numbers 2, 3, 4, 5 and 6 respectively (digital) which is the input signal to the Arduino board.

3. Connect the ground of all the sensors to GND port.

4. The LED's which are the output signals, are connected to port number 8, 9, 10, 11 and 12 respectively.

5. Again connect the ground of all the sensors to GND port.6. Power is passed to the Arduino (7-12V)

5.1 ARCHITUTRE
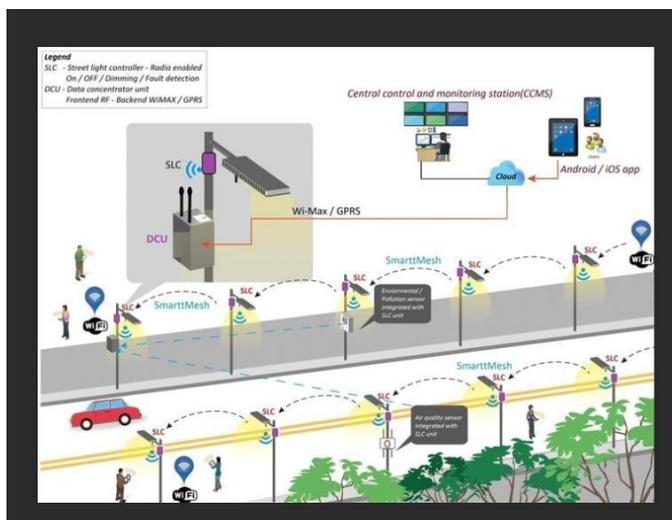
Street lighting is essential to ensure security in urban areas and enhance the quality of life. It also contributes to improving the safety of pedestrians, drivers, and riders. However, the brightness required at different times of the night is different and employing a system to manage the same can result in energy savings and provide cost benefits to municipalities and corporations. For instance, the brightness required during midnight is less compared to that required during the evening. Our automated street light management system controls brightness at different times of the night without any manual intervention. Statistics show that street lighting, including maintenance, represents 40 percent of the expenditure of a municipality

5.2 FULL WORKING DETAILS

This Smart Street Light System provides good energy efficiency. It reduces cost and gives more reliability. This diagram consist sensor, light, power system. This architecture is used to sense the vehicles and act accordingly. In this diagram street lights control by the sensors. It get the data from object. When vehicles appear to sensor then automatically lights ON. That the object moved on from sensors lights glows with ¼ of intensity. In this diagram its represents the works of Smart Street Lighting System. When objects or vehicles appear to the sensors it is detect movements of the objects and street lights automatically ON. Then objects crossed to the sensors lights glows with ¼ intensity. It is used to save the power energy. In this project the power daily used by the LED light it will notified to the smart street light management. By using this idea the manager knows how much of the current is consumed by the LED light daily
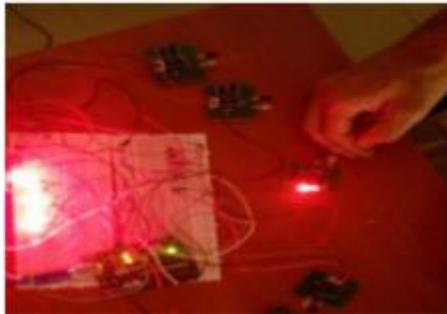
VI. CONCLUSION

By using Smart Street light, one can save surplus amount of energy which is done by replacing sodium vapor lamps by LED and adding an additional feature for security purposes. It prevents unnecessary wastage of electricity, caused due to manual switching of streetlights when it's not required. It provides an efficient and smart automatic streetlight control system with the help of IR sensors. It can reduce the energy consumption and maintains the cost. The system is versatile, extendable and totally adjustable to user needs. The system is now used only for one way traffic in highways. Continuous use of LDR and IR sensors even in day time. Not switched on before the sunset

The Smart light system can be further extended to make the current system in two-way traffic, making the system more flexible in case of rainy days

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