Monitoring and Controlling of Street Lamp using GSM Technology

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Abstract - *Street lights are the source of energy on the streets during the night time and these street lights provide the safety to the pedestrians at night time. The new type of street lights are the solar powered street lights that provide the light by using the solar energy stored in the solar panels, these solar street lights include a lot wiring technology and also its difficult to construct. In this project we are using the GSM technology, micro-controller and also different kinds of sensors like bio sensor, gas, smoke, sound sensor and also PWM dimming to do their respective jobs*

Key Words: **micro-controller, IOT, sensors, Server**

1. INTRODUCTION

In this world of urbanization, the role of street lights is very important they protect us, they guide us and also direct our paths to our destinations so normally if there's no electricity in the villages and remote areas, people face a lot of problems and even they may be physically hurt so In order to rectify this solar street lamps has been introduced which store the solar energy in the solar panels and these panels store the sunlight in the day and this energy is used in the night and the light is emitted this is the efficient way to conserve the electricity, but using this method the intensity of light cannot be magnified if there's more fog or smoke on the road and moreover if there's no person or vehicle on the road the light cannot be turned off , it has to be turned off manually by a person in the morning in order to avoid this issue we are using the GSM technology where the sensors are connected to the microcontroller and in turn this microcontroller is connected to GSM modem and this finally is connected to the LCD display. We also use a server to keep the things going

2. EXISTING SYSTEM

In the Existing system we find many types of street lights where the power consumption is not efficient and the intensity of light is not magnified when there is fog, rain and rainfall. Street lights are not maintained properly they are getting corroded by the environmental agents and a lot of Hard work is necessary to maintain these street lights it is being maintained by the street light officer. The complaint received from public, councilors and corporation officials either over phone is in person being recorded in the complaint register, the complaint registered is handed to the certain street light officials where they repair the street light which involves a lot of wiring work. Fixing these lines may take more than 2 to 3 days which creates a lot of problems to the people and also sometimes telephone line may be busy, sometimes no response.

3. PROPOSED SYSTEM

In proposed system we have introduced the GSM technology with SMS facility. this includes GSM modem, sensors, micro controller we, in our project have used the following sensors to make the street light smart which also known as smart street light, by introducing the sensors and micro-controller the street light works automatically. With the help of GSM facility, we can get a notification to our mobile about the information of the street light, we can also increase the light intensity according to the weather and also with the help of sensors the street light detects the cars and persons and automatically the street light gets turned on and when there are no cars or bikes or persons on the street the street light gets turned off, by doing this we can use the electricity efficiently and if the street light encountered any problem then it is notified to the mobile phone or the concerned administrator and it's also very easy to rectify the problem very easily and swiftly the sensors we used are

1. Biosensor – it is an analytical device used for the detection of an analyte that combines a biological component with physiochemical detector

2. Gas sensor – it detects the gas This type of equipment is used to detect a gas leak or other emissions and can interface with a control system so a process can be automatically shut down. A gas detector can sound an alarm to operators in the area where the leak is occurring

3. Smoke sensor – it senses smoke Commercial security devices issue a signal to a fire alarm control panel as part of a fire alarm system

4. sound sensor - Sound Sensor can detect the sound intensity of the environment. The important part of the module is a microphone, which is based on the LM386 amplifier and an electret microphone. The output is analog and can be easily sampled and tested

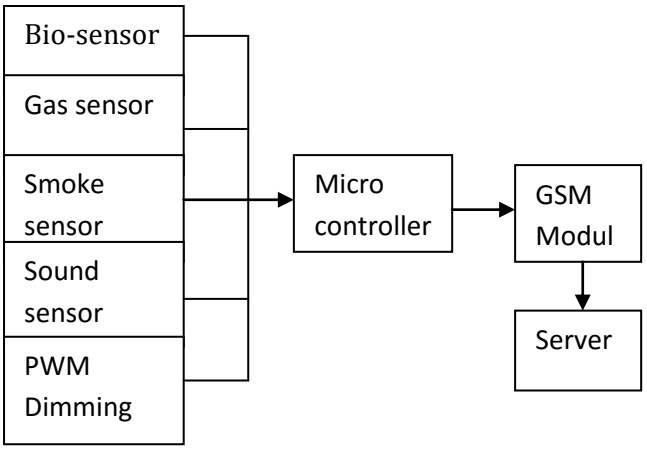
5. PWM dimming – it is a modulation technique used to encode a message into a pulsing signal. This modulation technique is used to encode information for transmission, its important function is to access the control of the power supplied to electrical devices, especially to inertial loads such as motors.

6. micro-controller - it contains one or more CPU's along with memory and programmable I/O peripherals Program memory in the form of ferroelectric RAM, NOR flash or OTP ROM is also integrated on chip, as well as a small amount of it on RAM.

7. GSM module - GSM (Global System for Mobile communications) is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation digital cellular networks used by mobile devices such as tablets

8. Server – a system that responds to the requests.

4. SYSTEM ARCHITECTURE



The data from the Bio sensor, Gas sensor, Smoke sensor, Sound sensor, And PWM dimming is sent to the micro controller which controls the recording or it intimidates the information and the data is sent to GSM module which maneuvers the street lamping system the main work of the system is to get the information or record the information and send the same to the main server.

5. MODULE IDENTIFICATION

Our system maneuvering of street lamp using GSM technology is divided into three modules based on its functionality

- Street lamp switching on and off
- Sensor module
- GSM module for maneuvering

1. Street lamp switching on and off:

- the solar energy that is energized and stored in the storage area is being used if and only if it is in use
- the switching on and off is taken care by the automated structure that is been programmed using the raspberry pi with the help of the bio sensor. Automatically this gets on and off as programmed and instructed to it

2. Sensor module:

- the sensor module which is integrated with 3 sensors in it and those are:

CO2 emission sensor, noise sensor, fog sensor

- the CO2 sensor takes care of the emission control when it gets more a message specifying the defect goes to the server with the GSM technology and same holds for the noise and fog sensor
- For fog sensor if the fog is more the intensity of the light gets multiplied so that the lights are on at anytime
- With these three sensors there is one another component namely Dimming PWM which is used for the Dimming of light using pulse width modulation.

3. GSM Module:

- This module is the main hub of the project which maneuverers the street lamping system
- the main work of this module is to get the information or record the information and send the same to the main server
- the module is on the whole collaborated with a micro controller which controls the recording or intimidating the information.

6. CONCLUSION

From this project we conclude that this is a system which is need of implementation for our country especially because the street lamps are not maneuvered properly by the management. This project isn't the one which has not even come but some advancement we have made and have done the project. This project also has much advancement which can be tried in the future scope.

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