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Smart Street Light and Motor

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Abstract:

1. ***Smart Street Light: Electrical Energy consumption of a nation is an indicator of the economic and social growth of the country. With the increasing demand for non-conventional energy resources, the conservation of energy is an important domain in current research .Energy Conservation can be the best solution for the rising energy demand .Utilizing electricity efficiently and reducing its wastage as much as possible is an important criterion considering the depleting natural reserves of fossil fuel traditionally used its generation. This paved way for developing appliance based automation for energy conservation. The PIR sensor provides an alternative method to save power consumption by detecting human movement.***
2. ***Smart Motor: Technology has been developing throughout the world as system moved from manual to auto. Appliances are Inductive, resistive and capacitive in nature. Inductive type are mostly motors. Three-phase Induction motor is one of the most common types of electrical machines with vast amount of applications in the entire power system all over the world due to its various advantages such as low starting power, lower maintenance cost etc. For the sake of economy and their longer life, it is very much necessary to provide them with feasible conditions to perform optimal operation with best possible smart protection techniques. Control elements used here are vibration as well temperature sensation with GSM based remote data acquisition technique for automatic operations as well as a manual control using a selector switch for automatic as well as manual operation and a molded case circuit breaker for protection purpose.***

I. INTRODUCTION

A. Smart Street Light

An intelligent street lighting system is a system that adjusts light output based on usage and occupancy, i.e., automating classification of pedestrian versus cyclist, versus automotive. The street light controller installed on the street light pole will control LED Street lighting depending on traffic flow, communicate data between each street light. Automate streetlights are necessary while to survive in the area of smart world.

As automation provides perfection and efficiency in this paper, we are focusing on automated street lighting, as current system is facing many problems.

Here we are considering the problems which are done manually. A user has to deal with numerous problems like maintenance problem, timer problem, connectivity problem, display problem. Street lights became part of our life since early 1800`s as they enable us to see during the night.

Street light is a raised source of light on the edge of a road or path. Similar lights may be found on a railway platform. When urban electric power distribution became ubiquitous in developed countries in the 20th century, lights for urban streets followed, or sometimes led.

Street Lights are the major power consuming elements in any city. We sometimes come across many cases where the street lights will be turned ON even in the day time, which is completely against the energy conservation rule.

B. Smart Motor

Induction motors run at fixed speed and are ideally suited to application where a constant motor output speed is required. However there are some applications where varying motor output speed . While equipment like conveyors may be fine for a fixed speed there are some applications which are better suited to running at variable speeds such as fan, pumps, winders and precision tools. Some wise scientist once said that control system is a system where we can shut down the machine whenever we want. That’s the difference between controlled and uncontrolled machine.

Our project is about to perform the function of ON and OFF method using GSM Module. This makes the monitoring and controlling process become accessible everywhere and every time. It is remotely controlled through smart phone.

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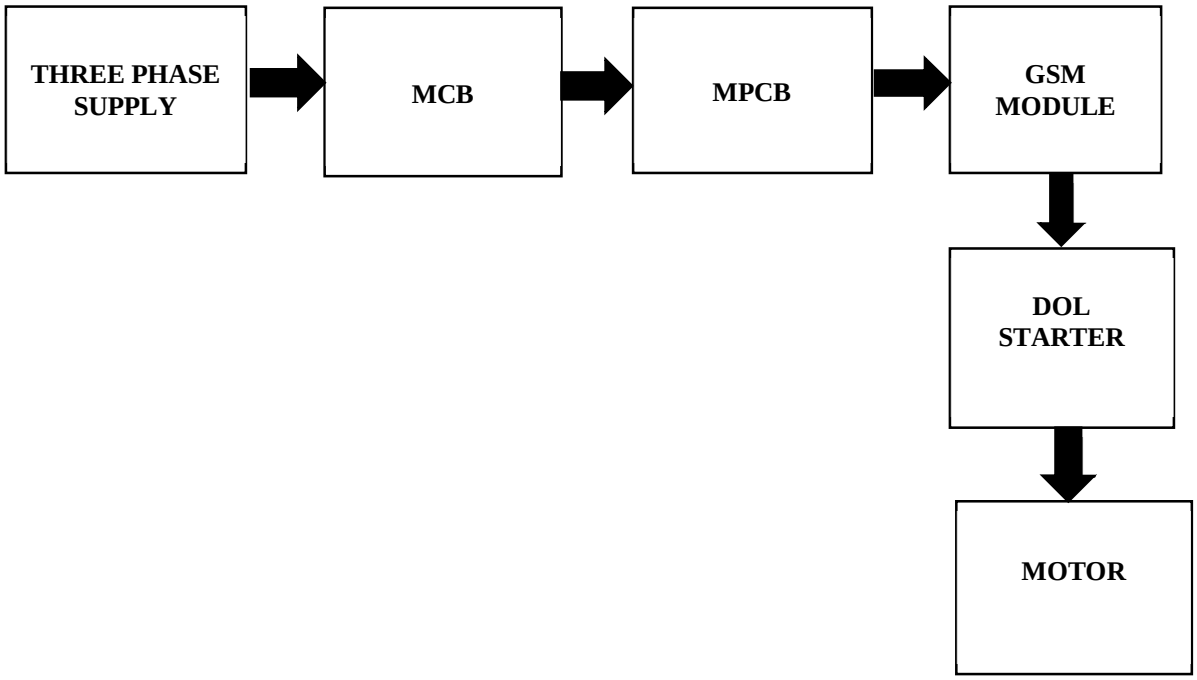

FIG 1: BLOCK DIAGRAM OF SMART MOTOR

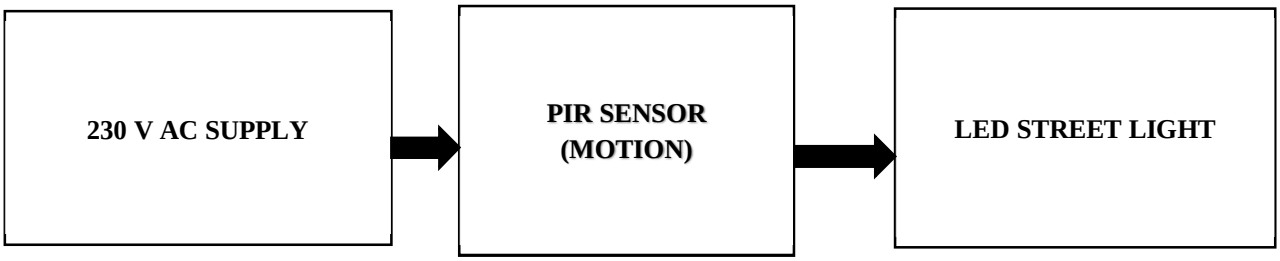

FIG 2: Block Diagram Of Smart Street Light

II. RELATED WORK

A. Smart Street Light

Basic purpose of this project is to make street lights intelligent so that it can turn it on and off itself. Smart system as its name suggest implements a smart instrument to make the street lighting more controllable and save the energy. Such system minimizes the operating hours of the streets light in the case of no purpose of lighting in which it off the streets lights after the midnight. The application is designed in such way that we place PIR sensors in all the street lights circuit and which are responsible to switch on and off automatically.

PIR sensor operation as follows:

1) *If object or person is present, then the intensity is 100%. It will reduce to 100% if no vehicle or person is present in the surrounding.*
2) *Presence of human on the road will be sensed by the PIR sensor. This sensor signal sent to PIR control drive which will gives output signal to the LED then intensity of light will be increased automatically 100%.*
3) *Proximity* sensing area of street light is 6 meters.

Many lamps have light-sensitive photocells that activate the lamp automatically when needed, at times when there is little to no ambient light, such as at dusk, dawn, or at the onset of dark weather conditions. This function in order lighting systems could be performed with the aid of solar dial. Many street light systems are being connected underground Instead of wiring from one utility post to another. Street lights are an important source of public security lighting intended to reduce crime.
Suppose if any presence of human in above 2 to3 minutes duration on the road that will sensed by the PIR sensor and this sensor signal send to the LED then intensity of light will be increase automatically (100%).

B. Smart Motor

GSM module makes the monitoring and controlling process become accessible everywhere and every time. The GSM Motor starter is used to perform ON and OFF function of the motor remotely through phone.
GSM modem can be connected to the existing Load starter. User has to simply insert the SIM card in the device & configure master number. Master number can operate the Load by Call or SMS. Master number will receive the SMS of events like Load ON/OFF, Error, Error recovery, Power ON, Power fail, Phase fail and SIM balance through SMS and call back from device.

III.CONCLUSION

A. Smart Street Light

This Project of Smart Street Light is a cost effective, eco-friendly and the safest way to save the energy. It clearly tackles the two major problems that the world is facing today, those are saving of energy and also disposal of incandescent lamps. According to statistical data we can save more than 30- 40% of electrical energy that is now consumed by the highways. This project can be used in various applications like street lights, balcony, home automation, garden, parking. In coming days, this will prove a great boon to the world, since it will save a lot of electricity of power plants that gets wasted in luminating the street lights. As the conventional sources are depleting very fast, now it's time to think of alternatives. Along with energy saving it also tackles with the problem of power theft. It is capable of taking corrective actions in case of unprecedented events of climate changes. Our government is striving hard to provide electricity to customers. Thus, project once implemented on a large scale can bring in significant reductions in the power consumption caused by street lights.

B. Smart Motor

GSM is a paradigm which makes each object as an intelligent object. Intelligent objects have the identification, sensing, communication and processing features which makes them capable to communicate with other objects, software and services running on the internet. These modules monitor and control of the Induction Motor required solving the aforementioned problems. Proposed System is found capable to ON and OFF the motor through GSM.

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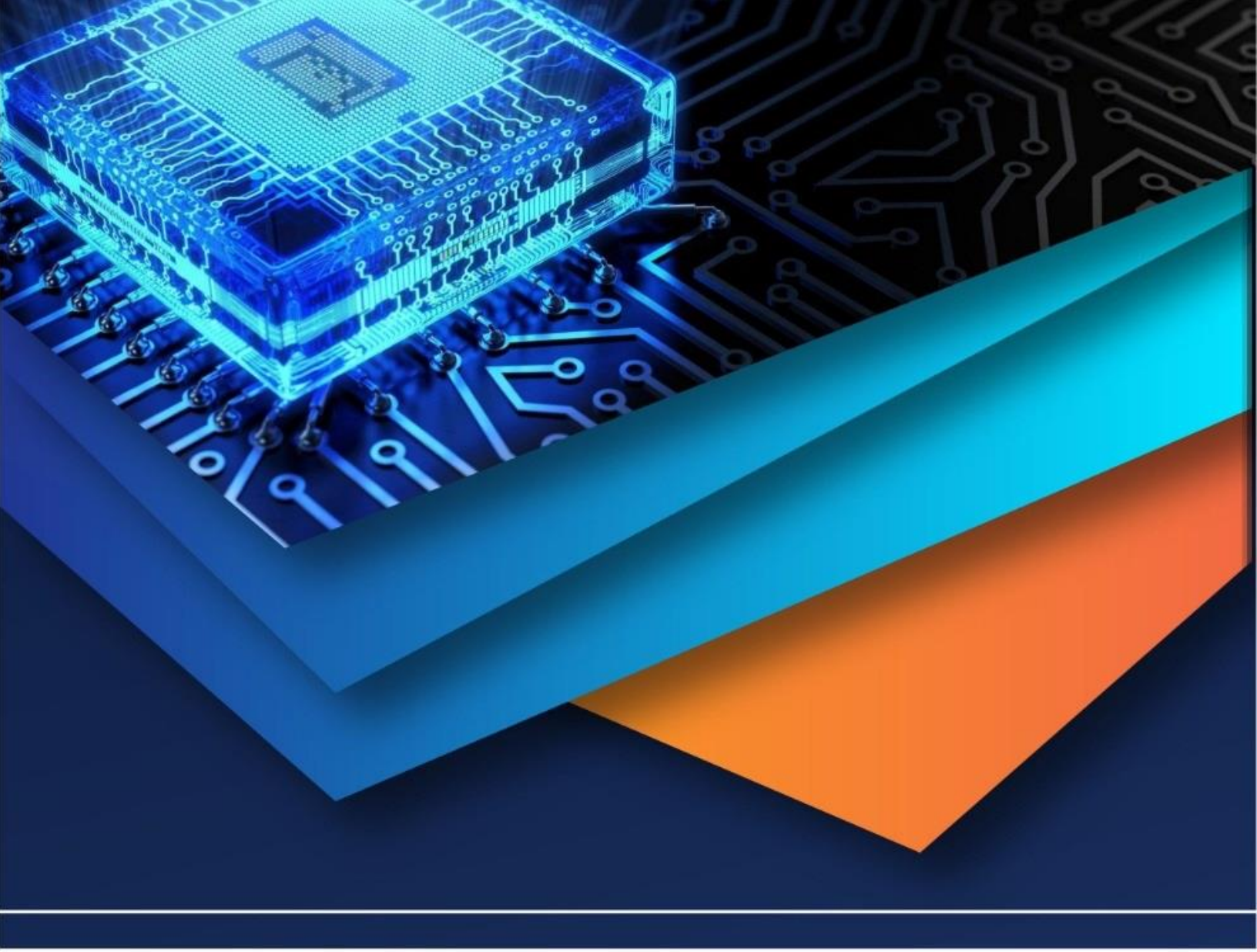

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