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ENERGY SAVING SYSTEM USING EMBEDDED SYSTEM FOR STREET LIGHT CONTROLLER

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ABSTRACT

To overcome the disadvantage of LDR an astronomical timer is used. The main thought is to save the energy in twilight mode and to use ILM technology where ILM is an Individual Lightening Monitoring. Due to this energy can be saved more than existing system. These both technology are more succeeded in real time

I. INTRODUCTION

Street light controller are saving the energy conservation by using timer switch so that more energy can be saved. They come with energy conservation option in twilight mode, staggering or dimming. In this project the street light controllers with an astronomical clock for a particular location (or) a GPS connection to give the best ON-OFF time and energy saving .Transistor is used as a switch to switch ON and OFF the street light automatically .By using this system manual works are reduced. It automatically switches ON lights when the sunlight goes below the visible region of our eyes .It automatically switches OFF lights under illumination by sunlight. The main notification is luminous is noted for public convenience. This is done by astronomical timer. The major advantage in this project is using an astronomical timer so that energy can be saved in twilight mode also.

II. OBJECTIVE

The main objective of this energy saving system is improving energy efficiency, cost effective and saving energy on twilight mode. Luminous should be comfort to public.

III. BLOCK DIAGRAM

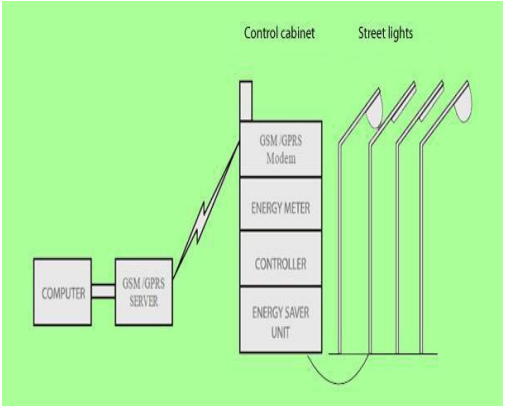

Fig. 1 Block diagram

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IV-HARDWARE REQUIREMENTS

RLC-Remote Load Control

RMC-Relay Modelling Control Relay module

Energy meter

SMPS-switch mode power supply Contactors

Rotary switch

Toroidal transformer MCB

MCB tripper

Input and output connectors Connecting wires

Box

Door temper switch Buzzer

Channel

RLC COMPONENTS:

MC microcontroller IC-PIC- 18F46K22 EPROM-24M02

RS232-MAX 232 (ENERGY METER COMMUNICATION)

RELAY DRIVER-ULN 2003N SIM 900A-MODEM

MOSFET -4437(MODEM on/off) REGULATOR-LM2576

V-PROPOSED SYSTEM

Work in this project is towards the design of a cost effective and energy efficient street light control system. It automatically switches ON lights when the sunlight goes below the visible region of our eyes. By using this system energy consumption is also reduced because nowadays the manually operated street lights are not switched off even the sunlight comes and also switched on earlier before sunset so this is reduced by using astronomical times clock. By using astronomical timer switch can reduce the energy conservation by a variations in month for example: In the month of march a sunlight stays more longer so by using astronomical times switch it can be automatically switch on the light after the sunset fully this is possible for all the month. A month variation is programmed by this more energy can be saved than existing system. A GSM system is used for controlling the device and for regular checking purpose and for informing fault.

VI ASTRONOMICAL TIMER

SWITCH

Time Switches are used to control events with respect to real time clock (RTC) whereas timers are used to control processing times. Therefore RTC forms the basic difference between timer and times

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switch functionality. With the help of Time switches it is possible to switch ON and OFF devices like lights, heaters, etc automatically at desired time of the day / night thereby giving the advantage of convenience and reduction in power wastage or substantial energy savings. The need of automation in street light system is for accurate switching of lights at sunset or twilight sunset and switch OFF at sunrise or twilight sunrise with energy savings.

PROPOSED SYSTEM

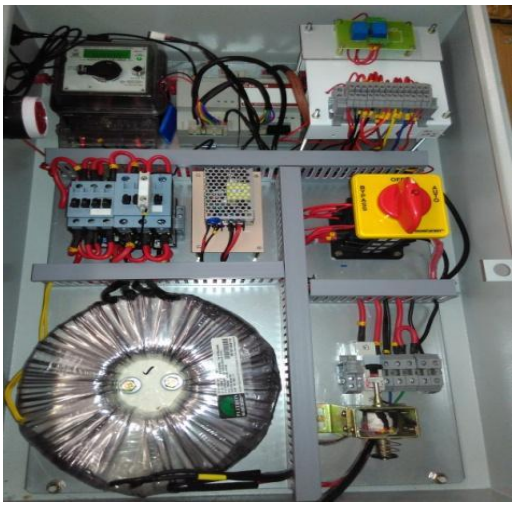

Fig.2 Single phase of street light controller

VII-TWILIGHT

It is observed that there is sample amount of light available even after the sun has set or prior to sunrise. This period is around 20 minutes on an average during sunset and sunrise. This feature can be used for more energy savings. The reference time for Astro can be based on either sunrise/sunset or begin/end twilight. Reference on twilight can harvest maximum natural light throughout the year. Even 5 min saving due to twilight saves thousands of rupees over a year. Here twilight times are calculated using astronomical mathematics.

Sunrise	Twilight	Difference
6:53:00	6:29:00	24
Sunset	Twilight	Difference

	Set	(Minutes)
18:13:00	18:36:00	23

Tab.1 Savings in electricity due to accurate switching at twilight

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VIII-FUNCTIONALITIES OF

PROPOSED SYSTEM

ENERGY SAVING:

Energy Saver guarantees 30% reduction in energy consumption under normal working conditions. It reduces the power consumption by optimizing the voltage to the lamps. While optimizing voltage, care is taken to maintain the flux as per ISI standards.

AUTOMATIC SWITCHING:

GPS location based switching of streetlights.

WIRELESS MONITORING &

CONTROL:

State of the art GSM/ GPRS technology is used for monitoring and controlling the street lights.

FEATURES:

- Guaranteed operating efficiency of 97% (higher than industry standards) with the use of highly efficient Toroidal transformers
- Dynamic Voltage reduction: provides stabilized voltage to the lamps.
- Automatic On/Off based on Sunrise/Sunset or on programmed timings
- Wireless control and monitoring through sophisticated web-based software
- Automatic bypass in case of tripping with manual changeover in case of maintenance or emergency
- Reduces operational, maintenance and running cost
- Reliable and safe changeover with On-Load tap changing
- Completely remote programmable ON/OFF timings, alert and energy saving settings.
- Instantaneous alerts for critical fault conditions to your mobile phone
- Energy saving reports and lamp failure reports on daily, weekly and monthly basis for single, multiple or all devices
- Detection of Energy theft or leakage
- Maintains a high power factor of above 0.85
- Guaranteed operating life upto 10 yrs &ISI standard.
- Eco friendly and reduces public inconvenience.

IX-RESULT GRAPH BASED

ON LUMINOUS

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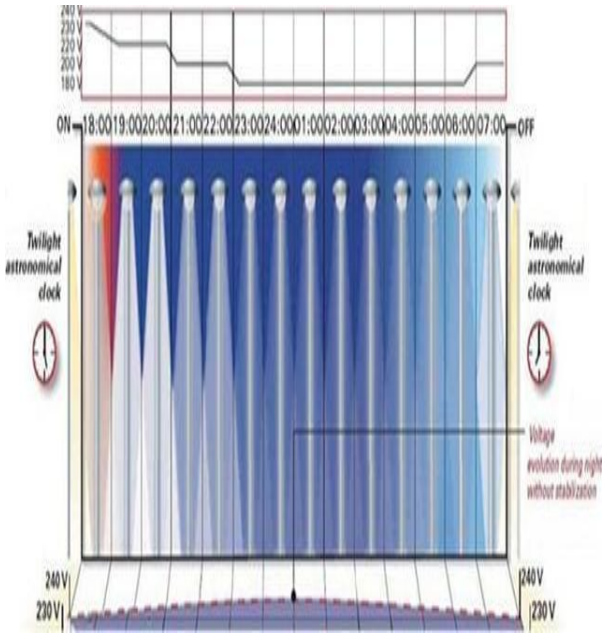
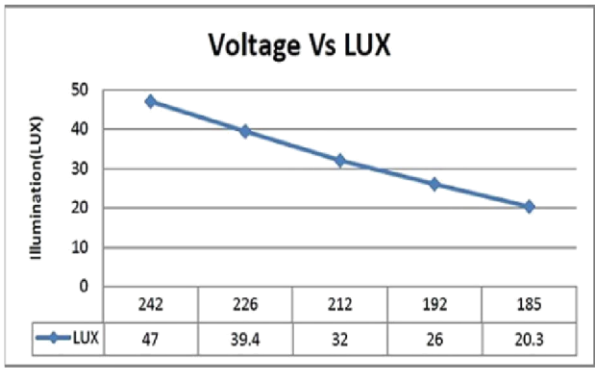
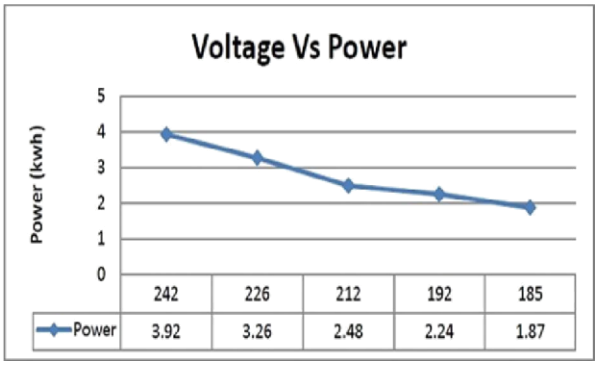


Fig.3 Result of street light controller based on luminous





X-CONCLUSION

This project describes a new street lighting system which integrates new technologies available on the market to offer higher efficiency and considerable savings more than existing system The energy consumed in existing system is 1000amps whereas in proposed system it is reduced to 700amps and it is economically comfort.

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