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Solar Street Light 120Watts with LIFEPo4 Battery by using Smart Sensor (PIR Sensor for Motion Detection 10M +)

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ABSTRACT: The demand of energy has increased in the world now. So ,to fulfill the demands of energy more and more fossil fuels are used as a result fossil fuels will extinguish in future if they are used at such a rate. To replace the loss of fossil fuels we can use renewable energy as they are freely available and adequate . The solar energy available during the day time is stored in a solar cell and the stored energy is used to glow the street lights during the hole night. A PIR sensor provides the automatic “ON/OFF”facility to the street light, so that it will glow automatically when it is required and it will be off automatically when it is not required. Most of the applications for the monitoring of human activities in an environment are based on video sensor data. As an alternative or complementary approach, low cost PIR sensors can be used for such applications

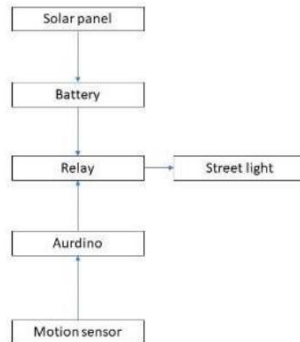
KEYWORDS: PIR Sensor,solar panel

I.INTRODUCTION

The use of the energy-efficient and smart LED street lighting has grown exponentially. MAS was chosen as a distributed control panel and described in [6] as a collection of autonomous computing units (in this scenario single LED street light with hybrid area, distance control sensor) (agent) [1], to predefined targets . According to the report, it runs jobs. Agents receive medical treatment Intelligence (a questionable logic architecture at the moment); They pursue the goal of improving measurement performance that can be accurately verified in the environment. In the author's view, not predetermined, is usually due to the need to light, dim, and/or dim the lighting at a specific or predefined time , no need to think about it. Cloud computing architecture will also allow and continuously manage different services of smart LED street lighting technology. Using intelligent light control according to who live on the street or live in cars According to the LITES project [1], if the electric lamps are strong sodium immediately, it will revert to LED technology.

Low level lights for open roads to strengthen efficiency and limit traffic by dimming the light safety of full lighting.The light intensity of LED 2 changes according to the motion detected by the motion sensor. When there is motion, the LED light stays at 100% for a period of time. When there is no motion, the LED's luminous intensity is about 70% of . The algorithm also determines the new power required for the LEDs in the particular system mentioned. This new energy is being used to create a new solar system. The design is modeled using HOMER software. This allows the use of smaller amounts of photovoltaic cells and cells, reducing additional costs and producing more energy.

II.BLOCK DIAGRAM



III.BLOCK DIAGRAM EXPLANATION

1. Solar Panel:

A solar panel is an essential component that captures sunlight and converts it into electrical energy. In this system, a high-efficiency solar panel is used to charge the LIFEPo4 battery.

2. LIFEPo4 Battery:

The LIFEPo4 battery is a rechargeable battery that stores the electrical energy produced by the solar panel. It is a high-capacity battery that can withstand harsh weather conditions.

3. LED Lamp:

The LED lamp is the lighting source in the solar street light system. It is a 120W LED lamp that produces bright and efficient lighting.

4. Smart Sensor:

The smart sensor is an essential component that detects the presence of people and vehicles and adjusts the lighting accordingly. It can also detect the level of sunlight and adjust the brightness of the LED lamp accordingly.

5. Charge Controller:

The charge controller is a device that regulates the voltage and current from the solar panel to the LIFEPo4 battery. It prevents overcharging and undercharging of the battery and ensures that it operates efficiently.

6. Inverter:

The inverter is a device that converts the DC power stored in the LIFEPo4 battery into AC power that can be used to power the LED lamp.

7. Mounting Bracket:

The mounting bracket is used to mount the solar panel and LED lamp on a pole or wall.

Overall, this solar street light system with a 120W LED lamp, LIFEPo4 battery, and smart sensor is designed to provide efficient and sustainable lighting for outdoor areas, while also conserving energy by adjusting the lighting according to the presence of people and vehicles.

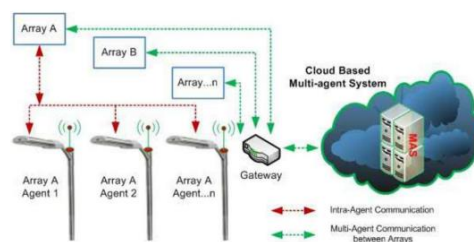
IV. PROPOSED METHOD

This system

- Increased energy efficiency – light delivered only when and where needed (less light pollution).
- Exact lighting-class determination on actual traffic data according to EN13201.
- New services and functionality added to the system (improved Return of Investment values).
- Introduction of new Prediction, Maintenance and Control algorithms.
- Decentralized control, the system can analyze and make decisions – the system becomes smart.
- Context data application to enable participation in energy price markets (like Nordpool) or adjust consumption according to current price forecast.
- Long and close range vehicle and human detection.
- Movement direction (L/R or R/L) detection, including detection of approaching or departing vehicles.
- Vehicle counting and in a lesser degree, pedestrian counting.
- Approximated vehicle velocity and vehicle headlight recognition.
- Ambient temperature sensing, ambient light sensing and wet weather detection.
- Compatibility with most existing lighting systems.

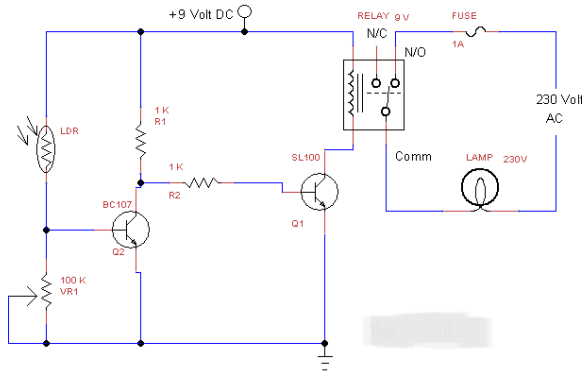
V. POWER MANAGEMENT AND SMART POWER

One of the joys of creating a data acquisition system that can also be used as a microgrid distribution and power management is the multitude of possibilities for control algorithms. As mentioned earlier, power management is controlled by the CMAS decision algorithm and can be optimized over time. However, the initial event is initiated by every Agent cycle generated in response to environmental or physical changes in its WE. The system is usually built from non-proprietary software for most of its features in terms of protocol options and later proprietary software of . In this case, the hardware of System may be the main point of demand. An interactive microarray working with its representative should manage data transfer to and from CMAS , which manages transitions, illumination levels, energy focus, and continuous analysis of the integration of microarrays .



Passive infrared (PIR) uses a pair of pyroelectric sensors to detect thermal energy in the environment. These two sensors are placed side by side, and when the signal difference between them changes (for example, when a person enters the room), the sensor is activated. This could mean sounding an alarm, alerting the police, or turning on a searchlight. Use a spotlight. IR electricity is focused on each of the two pyroelectric sensors using a series of lenses designed to accommodate the sensors. This lens expands the known area of the device.

VI.CIRCUIT DIAGRAM



EXPLANTION

A device connected to a Wi-Fi network is called a station (STA). Wi-Fi connectivity is provided by an Access Point (AP), which acts as a hub to one or more stations. The access point at the other end is connected to a network connection. A hotspot is usually connected to a router to access the internet from a Wi-Fi network. An IoT system consists of sensors/devices that "talk" to the cloud through some connection. As data reaches the cloud, it is processed by software, which then determines actions such as sending alerts or updating sensors. /device is not required for users. The Internet is a client-server system. When storing information accessible over the Internet, there are two main components: the client requesting the information and the server storing the information. Each requires software to communicate and exchange data. When the website is restored, the client uses a browser such as Netscape or Internet Explorer. A monitoring system using a PIR sensor circuit can be used for home, shopping mall, etc. security because the PIR sensor used in this system detects the movement of people around it. apartment. As a buzzer, you can use the sensor to detect human movement. This system can be safely used anywhere. Everyone in society now needs security to protect their devices or sensitive information from others – human sensors. The body moves and sends signals wirelessly. However, this project includes an automatic light power source and fan system. When the sensor hears a human voice in the sensor area, the room lights up after the sensor activates. Useful when you can't find your key in the dark. The operation of the fan depends on the room temperature, at lower temperatures the fan will start when the IR sensor detects movement in the detection area. The fan doesn't work when the room is cold. The temperature is measured in degrees with a thermometer and the temperature is displayed on the LCD screen (2x16). Lights and fans turn off when the user leaves the room. The lights and fans won't run, even if they're at room temperature, unless the PIR sensor detects motion in the sensing area. After the sensor is triggered, the system will wait for about 2 minutes. After 2 minutes, the sensors stop detecting motion and the lights and fans turn off automatically.

VII.ADVANTAGES

For all the devices or systems that have ever been invented, there are always advantages and disadvantages that come along with them. A SLSL system is basically a system consisting of LED lamps and they can be dimmed or illuminated to any certain level depending on the user's profile. The following are some of the present advantages of use of SSL over conventional lighting. 80% less energy use in addition to savings from high efficiency lamps. 50% or more savings per year in operating and control system in maintenance costs. Better living environments with more reliable and safer lighting. The ability to mix lamp technologies to suit the needs of the city and accommodate new lamp types. An expandable infrastructure that supports multiple applications such as traffic, weather, and motion monitoring. Tremendous reduction in CO2 emissions. Longer lifespan of LED lamps compared to HPS lamps.

VIII.APPLICATIONS

- Solar street lighting system uses the photovoltaic technology to convert the sunlight into DC electricity through solar cells.
- The generated electricity can either be used directly during the day or may be stored in the batteries for use during night hours.

- Photovoltaic cell which uses light energy from the Sun to convert solar energy into electricity.
- This electricity can be used to run many applications. single LED will emit less light than compact fluorescent or incandescent.
- The used storing electricity received by the solar panel daytime, and it provides electricity at night.
- Controller is used when and switch off the street lights also controls battery from undercharging and overcharging.
- consists MCU, secondary power supply battery charger, etc.

IX.RESULTS AND CONCLUSION

This paper of SOLAR STREET LIGHTING SYSTEM is cost efficient, practical and eco-friendly and very safe way to save energy. It very efficiently tackles with two main problems of today: saving of energy and disposal of incandescent lamps. Energy consumed by the highways now-a-days can also be saved that is the electrical energy by replacing it with solar energy. The use of solar-powered street lights has become increasingly popular in recent years due to their ability to provide sustainable and efficient lighting for outdoor areas. The Solar Street Light 120Watts with LIFEPo4 Battery by using Smart Sensor is an advanced system that incorporates smart sensors to detect the presence of people and vehicles and adjust the lighting accordingly, which saves energy and prolongs the life of the battery. The result of this system is a reliable and efficient lighting solution that can operate for up to 12 hours per night. The 120W LED lamp produces bright and consistent lighting, while the LIFEPo4 battery ensures reliable and long-lasting power. The smart sensor can detect the level of sunlight and adjust the brightness of the LED lamp accordingly, which maximizes the energy savings. In conclusion, the Solar Street Light 120Watts with LIFEPo4 Battery by using Smart Sensor is an innovative and sustainable solution that provides efficient and reliable lighting for outdoor areas while conserving energy and reducing carbon emissions. Its advanced features and durable components make it an excellent choice for a wide range of outdoor applications, including street lighting, parking lots, and public spaces.

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