

SMART STREET LIGHT SYSTEM BASED ON IOT

¹D. Prabakaran, ²L.Prakasam,

^{1,2}Asst Prof, Dept of ECE, Sri Balaji Chockalingam Engineering college, Arni.

ABSTRACT

The project aim is to design an intelligent high tech street lighting pole that runs an embedded web server to provide smart web based services to people living on the street in addition to the energy efficient lighting management services and other emergency handling facilities. This smart lighting system can be implemented in cities, streets, campus, parks and sporting venue. The unique features of the project are described below. With the development of economy and urbanization, the street lighting system has become one of the crucial concerns of people. However, in street lighting system, the efficient management and energy-saving control of lighting system is very important.

1. INTRODUCTION

In system based on WSN, the information of pedestrians and vehicles on road is sensed and collected by a sensor array, which consists of different sensors. It also provides some other services like telemetry, monitoring of noise, humidity, temperature and services associated with road information systems, intelligent transportation systems and intelligent roads. All the sensors are placed on the lamp pole and the efficiency of these sensors on the lamp are affected by sensing area, height of lamp pole, angle at which the sensor is kept etc. Second type of sensor (PIR sensor) is used for detecting movement of pedestrians and vehicles. The paper also presents a study on ZigBee-based wireless devices which allow more efficient street lamp system management. A scheme for a Zigbee-based street light control is proposed so that we can aim at reducing the human error in the operation of street lights. A lack of automation in the current system leads to large amount of human error in street lighting system. The information is transferred point-by-point using ZigBee transmitters and receivers which are then sent to a control terminal used to check the state of the street lamps and to take appropriate measures in case of failure. The system allows energy savings with increased performance and maintainability. Here we are making an intelligent lamp post which is managed by a remote controlled system that uses LED- based lightweight supply and is power is given by renewable energy (solar panel and battery). It is then implemented through a network of sensors to gather the relevant information associated with the management and maintenance of the system. Data is transferred in wireless mode using the ZigBee protocol.

2. EXISTING SYSTEM

A novel efficient design of Intelligent Street Lighting monitoring system using ZigBee network of devices and sensors on Embedded Internet Technology In this paper described that the system can optimize

the management and efficiency of street lighting systems. It uses Zig Bee-based wireless devices. It also uses a sensor combination to control and guarantee the desired system parameters. A monitoring system based on the embedded Internet technology for street light is designed and implemented. The mode adopted in this monitoring system is the Browser/Server mode. The realization technologies of an embedded web server are used. The results of system performance testing show that the system can meet most of the embedded internet applications demands and the purposes of online access, control and management of the street lighting using a standard web browser over the internet. In this paper described that the internet services provided in the smart home is performed by passive methods that people make a direct command for certain thing devices. Also, the present circumstance of thing internet service do not provide the infrastructure to offer public community services for the smart city associated with the smart home because most of the thing internet services have a private purpose orientation. Therefore, this paper proposes an integrated community service platform system architecture that can provide a single integrated and intelligent community services linked with the smart city and the smart home.

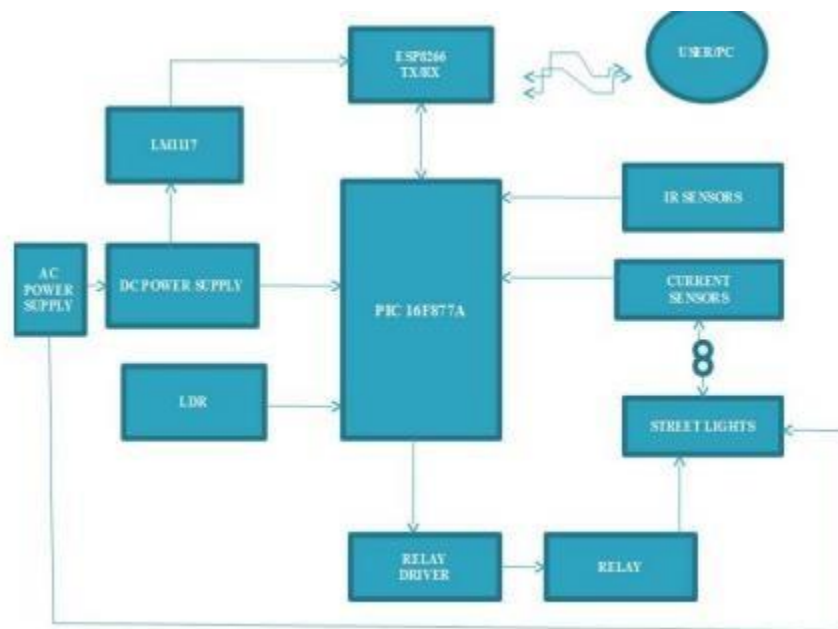


Fig.1. Block Diagram

In this paper described that the as technology advances, it is an urgent matter to develop a smart street light for energy saving and road safety. In this paper, we present a system design of LED Street light which integrates multicolor LED, power driving IC, and embedded image processing. The embedded system is used to monitor the road status and output control instruction. As the fog or rain is detected, the embedded system immediately instructs the power IC to drive multi-color LEDs for generating the lower color temperature light. The range of

changing color temperature is from 6500K into 2800K. This proposed LED Street light can be widely used to improve the road safety for pedestrian and driver in intelligent city. Additional modules can be integrated for more complex applications, such as search and- rescue, automatic object tracking, and traffic congestion analysis. Hardware architecture for the newly introduced Better Portable Graphics (BPG) compression algorithm is also introduced in the framework of the extensible quad rotor architecture. Since its introduction in 1987, the Joint Photographic Experts Group (JPEG) graphics format has been the de facto choice for image compression. However, the new compression technique BPG outperforms JPEG in terms of compression quality and size of the compressed file. The objective is to present hardware architecture for enhanced real time compression of the image. Finally, a prototyping platform of hardware architecture for a Secure Digital Camera (SDC) integrated with the Secure Better Portable Graphics (SBPG) compression algorithm is presented. The proposed architecture is suitable for high performance imaging in the IOT and is prototyped in Simulink.

3. PROPOSED SYSTEM

The system architecture of the intelligent street light system consists of IR sensors, LDR, PIC16F877A microcontroller, Relay, UART and Wifi Module. LDR's are light dependent devices whose resistance decreases when light falls on them and increases in the dark. When a light dependent resistor is kept in dark, its resistance is very high. The vehicle which passes by the street light is detected by IR sensor. Relay are used as a switch to switch on/off the street light bulb. A UART (Universal Asynchronous, Wireless Sensor Network (WSN) is a set of small electronic devices which comprises of a microcontroller, an RF transceiver and sensors. The WSN consists of 3 types of nodes which are coordinator, router and terminal nodes. Routers and terminal nodes are placed on the lamp pole, and coordinator nodes are kept on the lamp pole or are kept in the nearby community with the monitoring center. These WSN nodes can communicate with each other using dedicated protocols. WSN uses linear topology. The whole topology of the WSN is divided into many strip type sensor networks due to large no. of street lamps present near the roads.

4. RESULT ANALYSIS

Power is provided by a battery, recharged from a solar panel throughout the daytime. Charge controller manages the processes of the battery charge and power provide. Current generated by photovoltaic panels is handled by the controller to produce an output current for battery charge. Every lamppost being placed at the distance of 25 meters from one another, since modules have a range of 100 m outdoors. The functionality field tests were realized. The system is in a position to transfer data from any chosen lamppost to the management center when passing the info through the remaining lampposts. The transmission rate is 99.98% to 100% depending on the placement of sending unit. This proposed system may be expensive but higher prices of the lampposts are compensated by lack of costly wiring and the availability of power network and considerably lower prices of maintenance. There is low power consumption, powered by a renewable supply of energy through solar panels with no harmful atmosphere emissions and minimizing light pollution. Prices can be saved by using the highly economical LED technology which is supplied by renewable energy provided by the solar panels. And thus, we have the intelligent management of the lampposts. The system is versatile, extendable and totally adjustable to user needs.

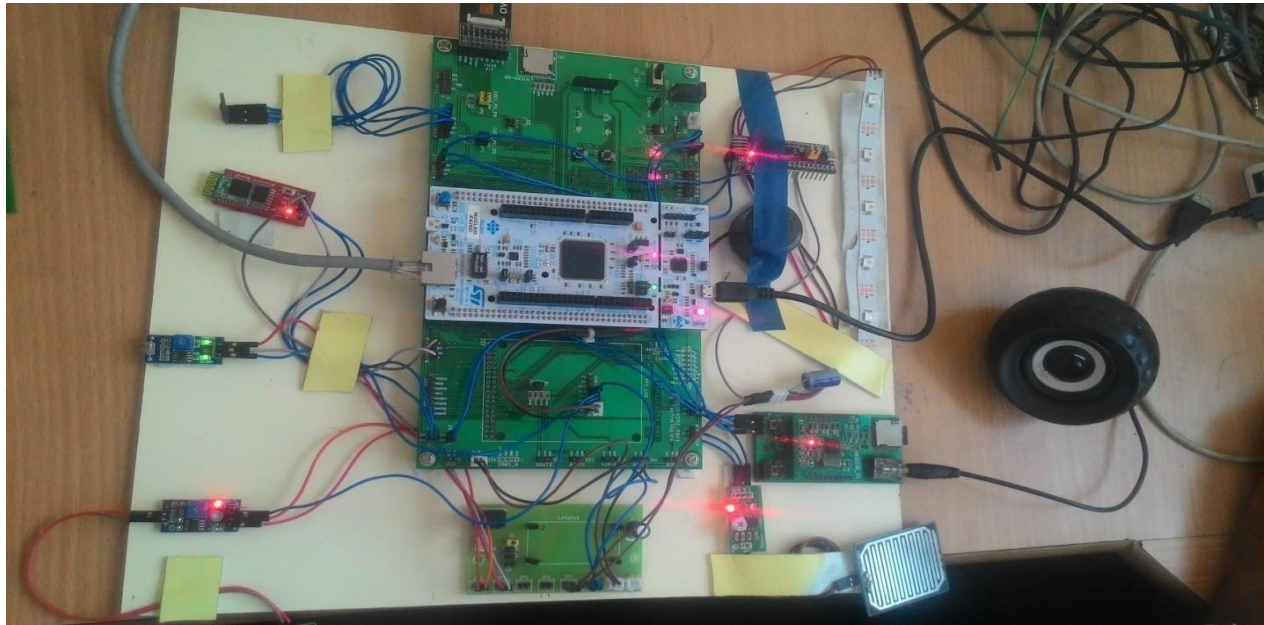


Fig.2. Hardware Kit

CONCLUSION

We design this street light which runs in low power and it can be accessed through internet any one can receive the data from anywhere in the world. We build many unique features like IP surveillance camera, Way Finding, Business advertising , Weather station, Rain and flood Monitoring, RGB LED light, Photocell control, Festival lighting , Emergency speaker, Push-to-Alert button which are not integrated and used before.

REFERENCES

- [1] Archana. G, Aishwarya N, Anitha J “Intelligent Street Light System” International Journal of Recent Advances in Engineering & Technology, Vol-3, Issue-4, 2015.
- [2] AkshayBalachandran, Murali Siva, V. Parthasarathi, Surya and Shriram K. Vasudevan “An Innovation in the Field of Street Lighting System with Cost and Energy Efficiency”Indian Journal of Science and Technology,Vol-8, August 2015.
- [3] DeepanshuKhandelwal, Bijo M Thomas, KritikaMehndiratta, Nitin Kumar “Sensor Based Automatic Street Lighting system” International Journal of Education and Science Research Review Volume-2, Issue-2 April- 2015 .

- [4] IsahAbdulazeez Watson, Oshomah Abdulai Braimah, Alexander Omoregie “ Design and Implementation of an Automatic Street Light Control System” International Journal of Emerging Technology and Advanced Engineering, Volume 5, Issue 3, March 2015
- [5] KapseSagar Sudhakar¹, AbhaleAmol Anil², Kudakechetan Ashok³, Shirsath Shravan Bhaskar⁴ “Automatic Street Light Control System” International Journal of Emerging Technology and Advanced Engineering”Volume 3, Issue 5, May 2013.
- [6] Mustafsaad, AbdalhalimFarij, Ahamed Salah “Automatic Street Light Control System Using Microcontroller” Mathematical method and Optimization Technique in Engineering ISBN: 978-960-474-339-1.