

CAPSTONE PROJECT

IOT Based Voltage, Current, Power Consumption monitoring and ON/OFF Control

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Abstract

Electricity is a basic human necessity that is extensively employed for home, industrial, and agricultural purposes. In this way, energy waste leads nations to lose revenue. Solutions based on technology, such as The Internet of Things (IOT) connects the physical and digital worlds, This IOT application ,In this scenario, manages and/or analyze energy consumption.. Furthermore, the advancement of micro and Nano-electronics has made it possible to the creation of connectivity modules like the ESP that enables the rapid deployment of a wireless sensor network effectively, using the least amount of energy possible employed for responsibilities of monitoring and control.

By developing a hardware and software solution, the given prototype takes advantage of the previously indicated features. It uses a scalable and modular platform with ESP technology and a developed protocol for data exchange between the modules that make up the system to allow remote monitoring of electricity consumption in a home. The prototype's accuracy is shown when compared to readings acquired with a regular electric bill, according to the conclusions.

Introduction

- Building management systems (BMS), proved to be a game-changer. The availability of a computer-based control system that could automatically monitor and manage a building's largest and costliest operational components helped facilities managers do their jobs better.
- Building automation systems saved time and money, reduced energy waste, and gave facilities managers a way to better monitor their operations.
- In our Project, We are focusing on developing the Intelligent Building so that We can reduce the Voltage Fluctuation Risk and Minimizing the Power Consumption by using IOT
- If the Voltage is fluctuating, we will get the notification and we can turn off the load remotely so that Building equipment wont be Damaged.

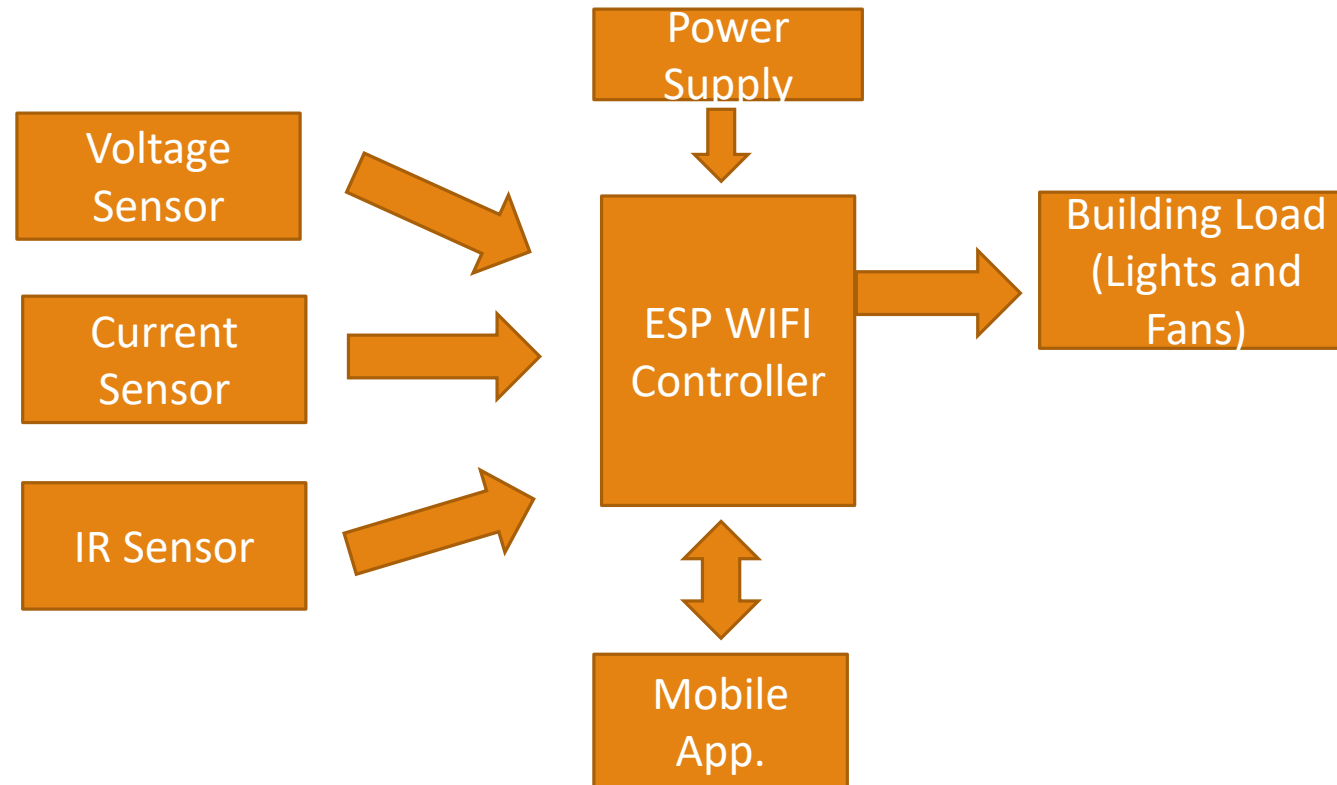
Objectives

- 1) To monitor the Voltage level in the Building
- 2) Notifying the Authorized Person if Voltage Fluctuates to prevent Damage
- 3) Monitoring Current consumption of Building
- 4) Calculating Units consumption of the Building and sending the data to Mobile App.
- 5) Providing interface on Mobile App. To control the building Load (On / OFF Control)

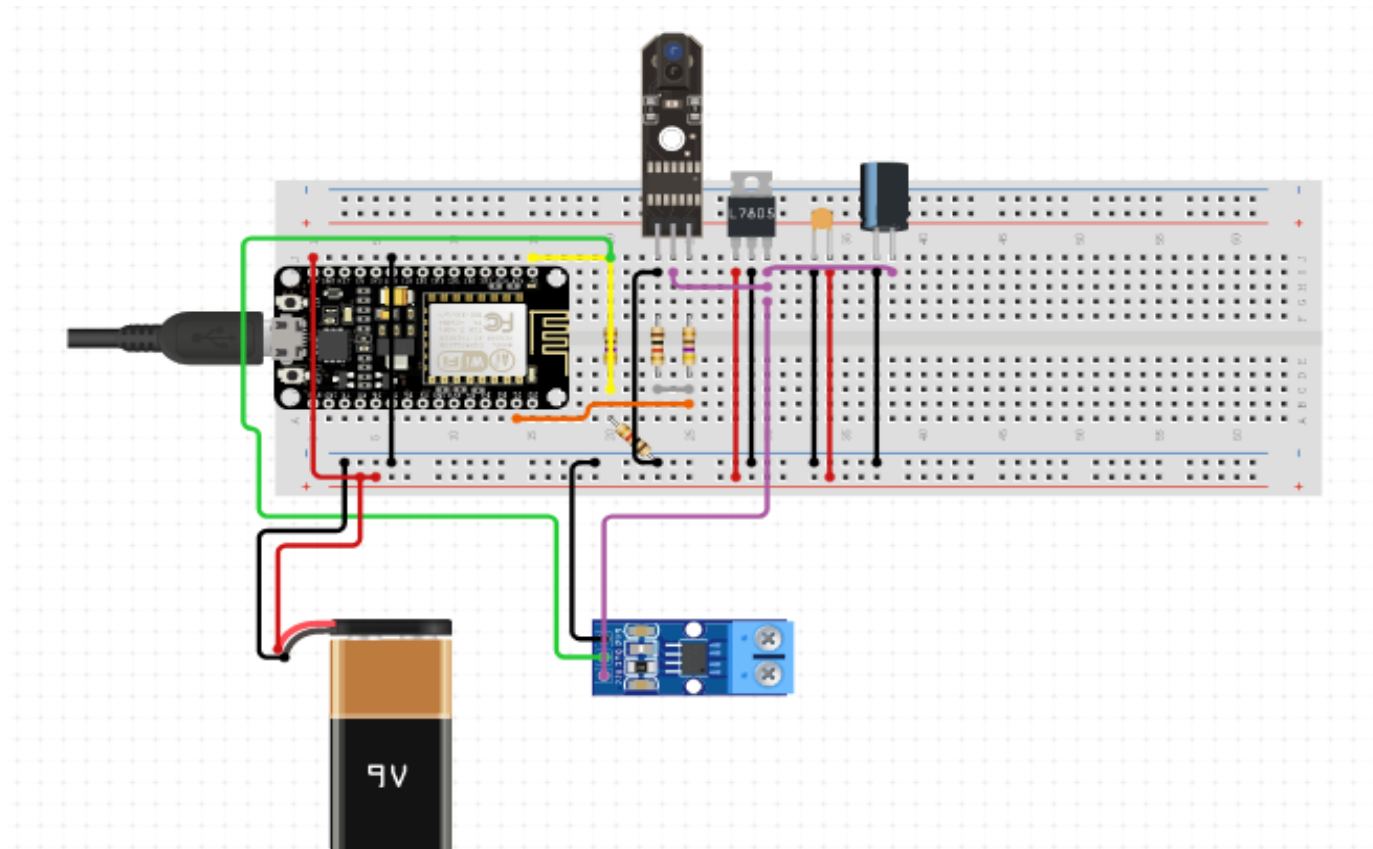
Literature Survey

Year	Paper Name	Author	Conclusion
2018	An IOT-based Remote Monitoring System for Electrical Power Consumption via Web-site Application	Darwin Alulema , Mireya Zapata	Energy is a valuable nonrenewable natural resource, and managing it allows the grid to operate more efficiently. A monitoring electrical circuit is included in the proposed prototype
2020	Internet of Things (IOT) based Energy Tracking and Bill Estimation System	Rishi Mathur , Kamlesh Kalbande	IOT based energy tracking and bill estimation system discussed in this paper with various sections is successful in building awareness about electricity usage by displaying realtime estimated electricity consumption by each connected to it and real-time estimated bill of total consumption on monitor

Block Diagram



Circuit Diagram



Proposed Methodology

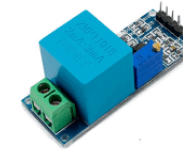
Arduino WIFI ESP Control

- 1) Heart and Brain of the System
- 2) Accepts the Real-time Input from Sensors, Compares it to the Code entered and Takes the Action in from of sending data to Cloud App. and controlling the Hardware output.



Voltage Sensor

- 1) Monitors the Line Voltage in series with Building Load



Current Sensor

- 1) Monitors the Line Current in series with Building Load



Explanation Of Block Diagram

Power Supply-

- 1) Provides Operating Power the the Control and Sensors
- 2) 12V DC Supply

Building Load-

- 1) We are taking Lights and Fan as the Building Load

Mobile App.

- 1) App. Monitors the Vtg, Current, Product Count
- 2) Controls the On / OFF Action of Lights / Fans

Pros and Con

Advantages-

1. Electricity Cost Saving
2. Transparency
3. Low Cost of Development

Disadvantage-

1. Should be kept in a metal case
2. Overheating can damage the IC

Conclusion

1. The conclusion of this project is that we can use Atmega Controller to control the System without Human Interference.
2. And the Sensor connected to it gives the Real time value on the handy device ,which makes the process comfortable.

References

1. An IOT-based Remote Monitoring System for Electrical Power Consumption via Web-site Application:-Darwin Alulema , Mireya Zapata
2. Internet of Things (IOT) based Energy Tracking and Bill Estimation System:-Rishi Mathur , Kamlesh Kalbande
3. The model for home automation using bluetooth via PC:-N. Sriskanthan
4. Designed a prototype electrical device control system using Web:-Muhammad Izhar Ramli

Thank You!

