

The Future of Street Lighting Using Motion Detection Technology

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1) Introduction

Currently street lights come on in the night and remain on until the next morning. The focus of this project is to come up with a more energy efficient method by introducing motion detection technology,



Figure 1: Motion Detection Prototype Build

2) Aims & Objectives

The aim is to produce a more energy efficient street lighting system using motion detection.

Objectives:

- Research to determine any existing street lighting energy saving methods.
- Design and Build of proposed street lighting system
- Evaluation of prototype build to determine viability and if it does indeed save energy in comparison to current method.

3) Design Requirements

Motion Detection – A motion detection sensor will ensure that the lights only become fully bright when there is motion detected.

Light Detection – A Light detection sensor will prevent the lights from operating during the day.

Microcontroller – The microcontroller will act as the brains of the system. Communicating with the surrounding lams to make a safe circle of lighting

Dimming – This involves adjusting the light levels so that lower light is output when there are no pedestrians around.

4) Implementation

Through planning, research and data collection two circuit designs were completed, one software design via Proteus ,which then required the PIC to be programmed using CCS to operate as intended, this was then tested and simulated. Once the simulation proved to be working, it could then be compiled to the selected PIC16F684 before being replicated on a breadboard for the prototype build

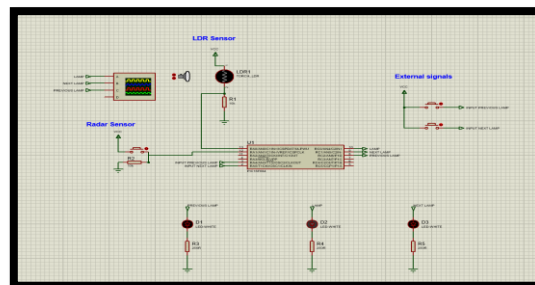


Figure 2: Proteus Circuit Design

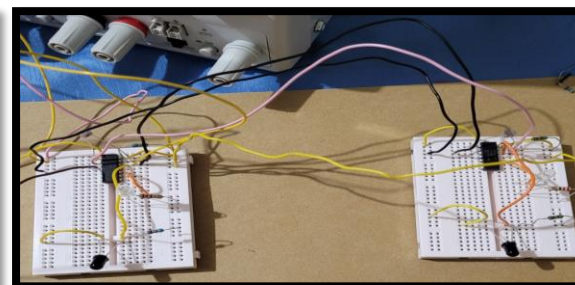


Figure 3: Breadboard Circuit Design

5) Testing & Results

Various methods of testing was completed, the aim was to prove that the proposed method with motion detection technology saved energy in comparison to the current method.

Below is one example of a test result.

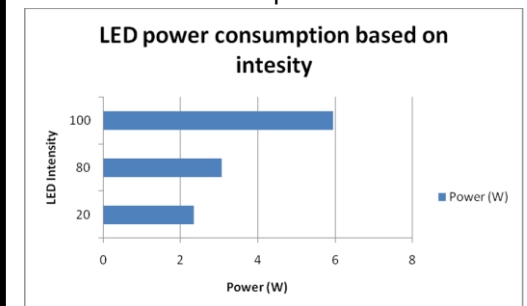


Figure 4: Power Consumption Test Results

6) Conclusion

To conclude, the main purpose of this report was to come up with a solution to save energy, in a world that is facing its biggest ever climate change crisis. The smallest of changes to the way we live can make a huge impact. The data collected from the prototype build backed up the research proving that motion detection technology does work on street lighting and it does improve the energy efficiency. Successfully achieving the project aim.