



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJIRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY

INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 13, Issue 4, April 2024

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Solar Grass Cutter Using IoT Application

Dr.M. Mahesh¹, R.Sai chandhu², M.Ramya³, B.Sakshitha⁴

HOD of Electronics Department, TKR College of Engineering and Technology, Hyderabad, India

Students of Electronics & Communication Engineering Department, TKR College of Engineering and Technology,
Hyderabad, India

ABSTRACT: This paper proposes the design and implementation of a solar-powered grass cutter integrated with IoT capabilities using Node MCU. The system aims to address the challenges of traditional grass cutting methods by leveraging renewable energy and IoT technology. The Node MCU facilitates real-time monitoring and control of the grass cutter remotely, enabling users to optimize its operation for efficiency and convenience. Through solar energy harvesting, the system reduces dependence on grid power and minimizes environmental impact. The proposed solution offers a sustainable and intelligent approach to grass cutting, suitable for both residential and commercial applications.

I. INTRODUCTION

Indeed, the evolution of grass cutting equipment has seen significant advancements over the years, transitioning from manual hand devices like scissors and push lawn mowers to more sophisticated machines powered by fossil fuels or electricity. While these advancements have made grass cutting more efficient and less labor-intensive, they have also introduced new challenges such as noise pollution, environmental concerns, and maintenance requirements.

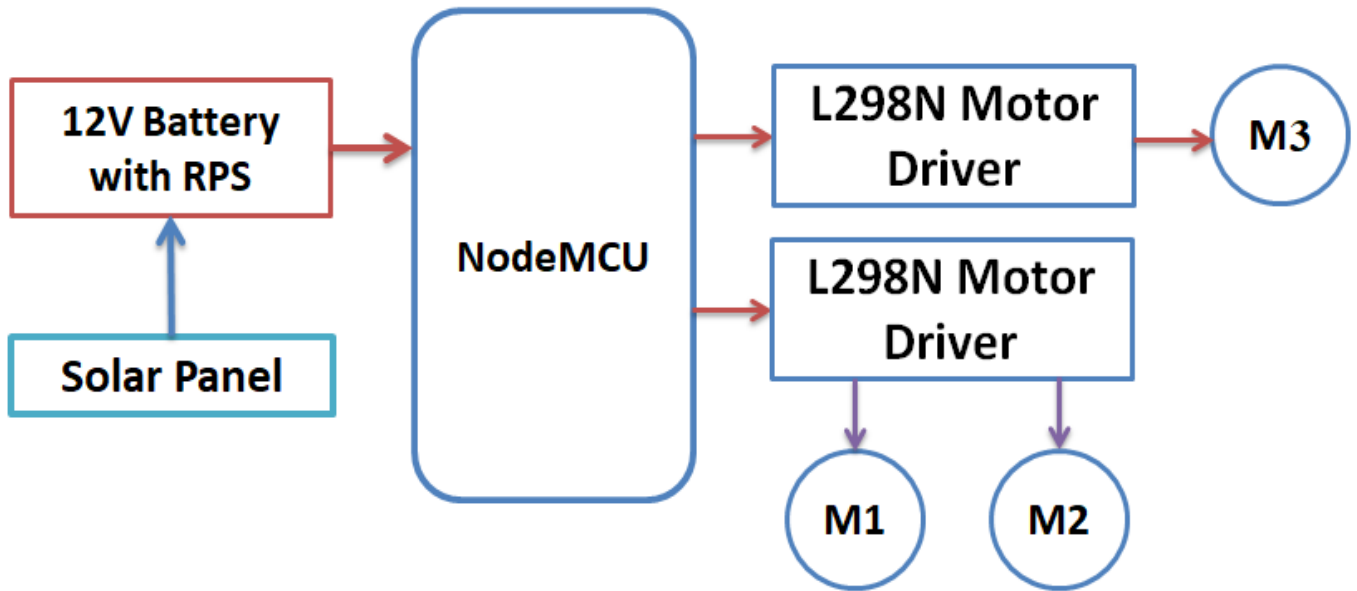
Manual grass cutting tools like scissors and push lawn mowers were suitable for small areas but were impractical for larger spaces due to the physical effort required. As demand grew for more efficient grass cutting solutions, petrol lawnmowers, diesel lawn mowers, electric lawn mowers, and tractor lawn mowers with rotary blades emerged to meet varying needs.

However, these powered lawn mowers come with their own set of drawbacks. Petrol and diesel lawn mowers produce loud noises, contributing to noise pollution, and emit pollutants harmful to the environment. Additionally, they require regular maintenance, including checking the petrol tank and replacing old petrol to avoid operational issues.

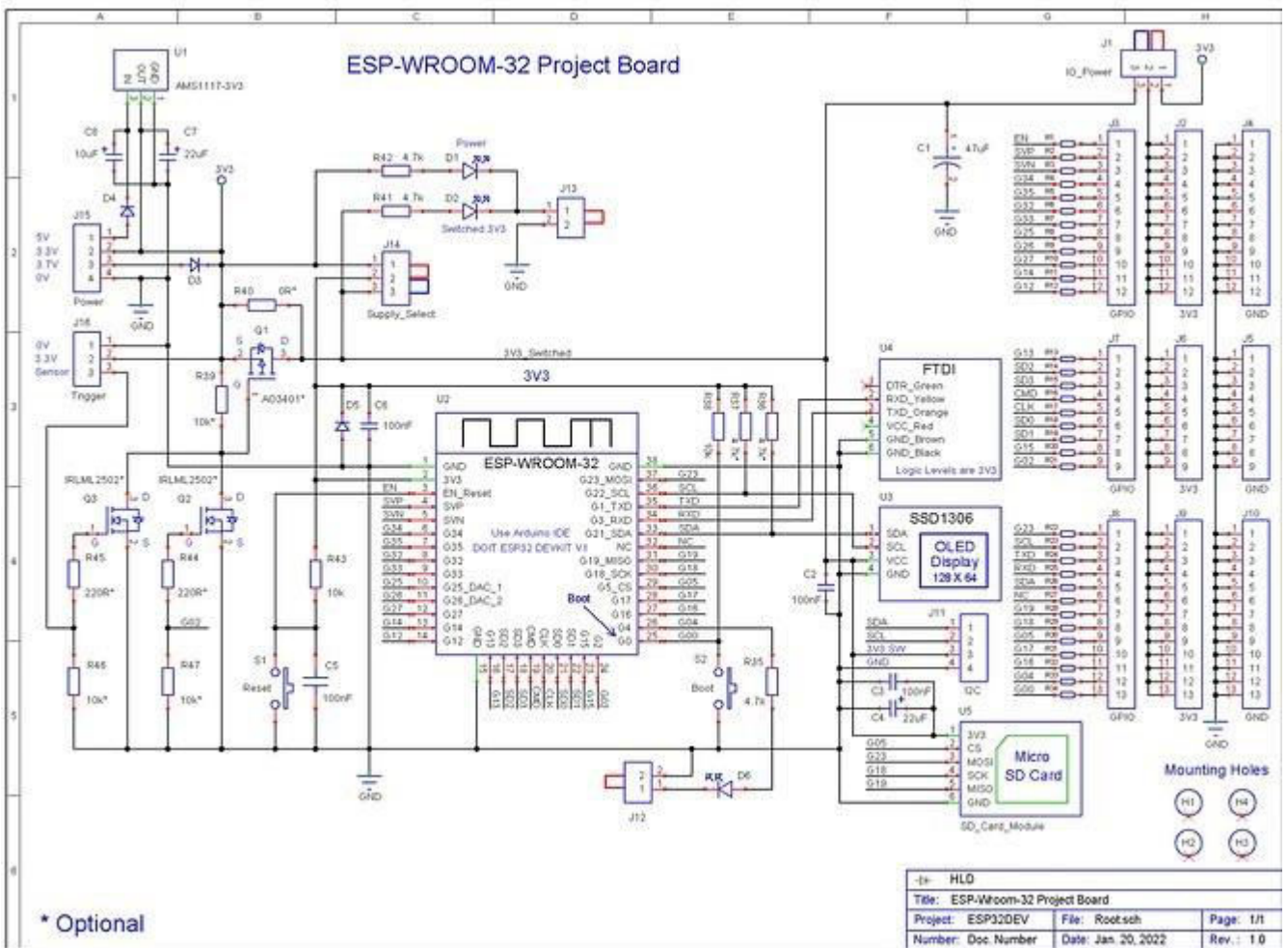
In today's environmentally conscious society, there's a growing demand for alternative grass cutting solutions that are quieter, more sustainable, and less polluting. This has led to the development of electric and battery-powered lawn mowers, which offer quieter operation and produce zero emissions during use. These eco-friendly options are gaining popularity among homeowners, businesses, and institutions seeking to reduce their environmental footprint while maintaining well-kept outdoor spaces.

Furthermore, technological advancements continue to drive innovation in grass cutting equipment, with features such as robotic mowers and GPS-guided systems offering automated and precise grass cutting solutions. As the demand for efficient and sustainable lawn care practices grows, we can expect further advancements in grass cutting technology aimed at minimizing environmental impact while maximizing efficiency and convenience.

II. BLOCK DAIGRAM



III. SCHEMATIC DAIGRAM



IV. WORKING

Creating an IoT lawn cutter with NodeMCU for remote control via a web browser requires multiple stages.

1. Setup and Configuration:

Assemble the grass cutter and integrate components like as motors, sensors, and the NodeMCU board. Configure the NodeMCU to connect to the local Wi-Fi network on startup. Following a successful connection, the NodeMCU should receive an IP address from the router. Once the IP address is obtained, the NodeMCU broadcasts it. Users can get to the grass cutter's control interface by typing this IP address into a web browser.

2. Web Interface Development:

Develop a user-friendly web interface for controlling the grass cutter's movements. The interface should include buttons or sliders for the following commands: forward, backward, right, left, stop. In addition, incorporate indicators for the grass cutter's current state, such as battery level or obstacle detection. Use HTML, CSS, and JavaScript to design interactive elements that are compatible with a variety of web browsers and devices.

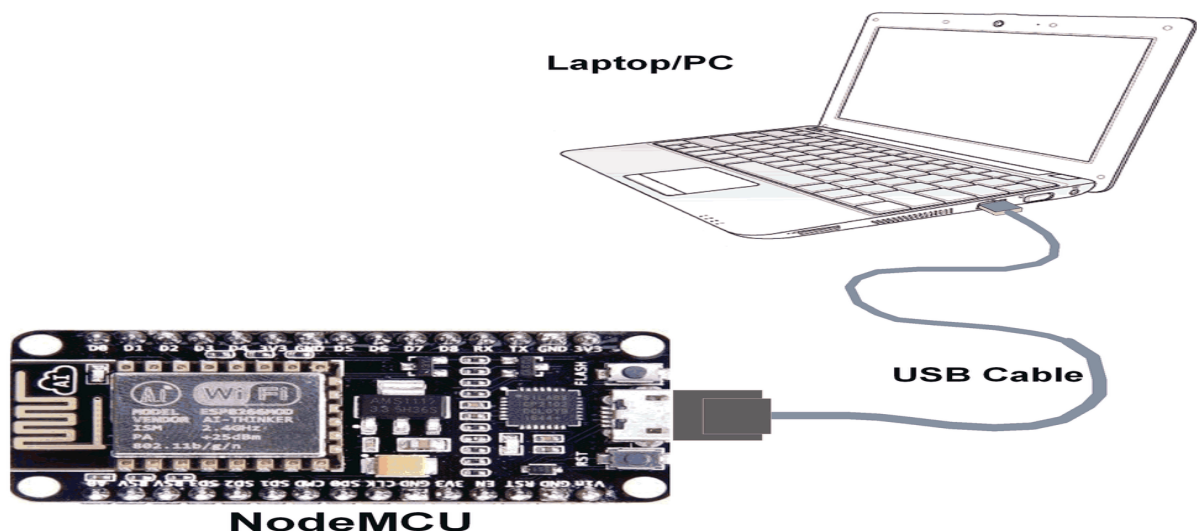
3. NodeMCU Firmware Programming:

Develop NodeMCU firmware to control the lawn cutter based on web interface commands. Set the NodeMCU to listen for HTTP requests sent by the web browser. When the NodeMCU receives a command, such as "move forward," it starts the appropriate motors to propel the grass cutter in the desired direction. Implement logic to safely process user input and prevent unwanted access to the lawn cutter's controls.

4. Integration and Testing:

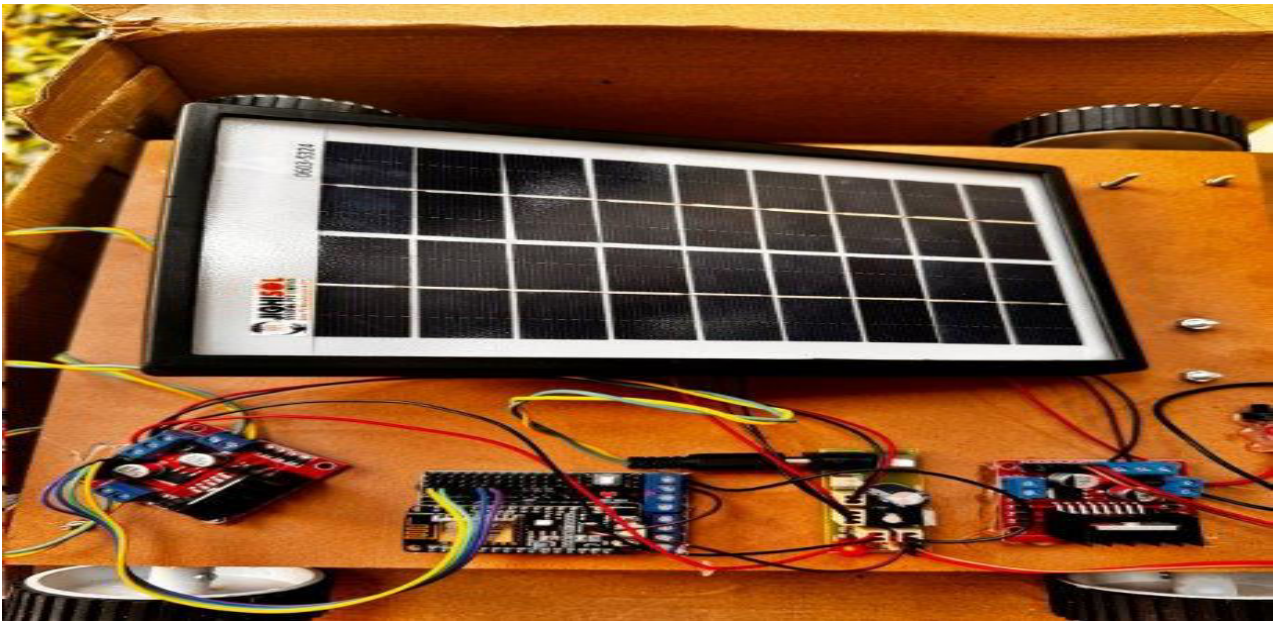
Integrate and test the web interface with NodeMCU firmware to ensure seamless connection between the user interface and physical components of the grass cutter. Conduct extensive testing to ensure that the system works properly in a variety of environments, including varied terrain types and obstacle scenarios. Evaluate the online interface's quickness and the accuracy with which the lawn cutter moves. Address any faults or bugs detected during testing, and fine-tune the system as necessary to maintain consistent performance.

V. EXPERIMENTAL SET - UP



VI. RESULTS

- Now a days energy plays an very important role in lot of peoples life. Here the solar panel is used for charging the battery when it gets discharged.
- Here we can control the grass cutter with the help of android phone so that we can cut the grass without much human effort.



VII. ADVANTAGES

- Low cost
- Easy to work
- Movable structure with small size
- Less power consumption
- Not effected by rust

VIII. APPLICATIONS

Residential lawn conversations
Public parks and gardens
Golf courses
Sports fields
Commercial landscaping services
Environmental conservation

IX. CONCLUSION

The Bluetooth-enabled solar grass cutter is a device that not only effectively leverages the Internet of Things, but also addresses the pressing need of the day to reduce reliance on renewable energy sources. It achieves the twin goals of using abundantly available energy sources and minimising human labour. Using a mobile phone application, both novice and expert users can effortlessly handle the gadget with just a few touches. This model is intended to serve as a greener alternative to the current generation of machines, in addition to performing the necessary tasks. In summary, if produced in big quantities, it is a more cost-effective process than the current one.



REFERENCES

1. J. Chincholkar et al. (2016) designed and developed a solar-powered grass cutter. The solar panel and rechargeable battery powered the robot's engine and cutting blades. The writers tested the robot on several varieties of grass and discovered that it was capable of cutting grass as tall as 3 inches. The robot could also negotiate difficult terrain.
2. J. Pradeep et al. (2018) presented a solar-powered grass cutter that may be controlled via a smartphone application. The robot was equipped with a GPS system, allowing it to navigate the grass and avoid obstacles. The authors conducted studies to assess the robot's efficacy and discovered that it could mow grass as tall as 4 inches.
3. In 2020, T. Wong et al. developed a solar-powered grass cutter with improved performance through machine learning techniques. The robot was equipped with sensors that detected grass density and height, allowing it to change its cutting height accordingly. The authors tested.
4. Prof. C. J. Shende: In this paper, they prepared a manually handle equipment capable of cutting grass. This gadget has linear blades and is not impacted by weather conditions. The primary goal of this paper is to move the grass cutter in different ways in order to create diverse designs based on needs. The cutting height can be modified via a link system. This device can be simply operated by unskilled labor.



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

 9940 572 462  6381 907 438  ijirset@gmail.com



www.ijirset.com

Scan to save the contact details