Journal of Electronics, Computer Networking and Applied Mathematics
ISSN: 2799-1156
Vol: 03, No. 05, Aug-Sept 2023
http://journal.hmjournals.com/index.php/JECNAM
DOI: https://doi.org/10.55529/jecnam.35.1.9

Smart Agriculture Automation using ESP8266 Node MCU

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Received: 02 April 2023 **Accepted:** 18 June 2023 **Published:** 01 August 2023

Abstract: Today agriculture is growing fast and changing day by day but farmers face problems every day,these problems are always problems every day, but if you do not solve this problem in time, it can create serious problems. The problem that the water pump works with three-phase voltage, but sometimes the three-phase voltage is not the same in three-phases, resulting in the dark voltage of one phase voltage or the high and low voltage of one of voltage level. If the water pump voltage becomes incompatible after a while, it will be burned or damage water pumps. Thesecond problem is that sometimes the water in the well will decrease in agriculture, but the pumpworks, that is, the pump runs dry, which will affect the pump because dry running will be damaged pump. The third problem is when water is used for plants to grow, but how can you besure that how much plants need water, this is important but you don't know you are wasting water.Our system, reducing impacts, protecting pumps and conserving water while maintaining the humidity our services require.

Keywords: ESP8266 Node, MCU, Smart Agriculture Automation.

1. INTRODUCTION

In smart farm automation, we can use ESP8266 node MCU microcontroller with built-in Wi-Fimodule to monitor our voltage level and protect the pump from conflict, we check if the pump is running dry. water pump with water protection is how much with or without the use of waterflow sensor, we can also monitor the water in the ground to use the water well, also how to measure or measure the water passes from the pump in litres and millilitres measure water efficiency and tolerance. This full assessment and management

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are available via the delegate web page.

Literature Review

Prithvi Raj U, Layan Ali, and Anu Shree Math [1] a significant part of agriculture is played in India. To maximise yields per unit area 3, it is therefore crucial to water your plants carefully for successful outcomes. Watering plants at a specified time is the procedure of irrigation. The project's goal is to install a sophisticated drip irrigation system on the National Institute of Technology campus in Karnataka to water the plants. The system controller utilised for this function is an open platform. As time goes on, new measurements of the variables impacting plant health will be provided using a variety of sensors. Using the data from the RTC module, the solenoid valve is managed and water is delivered to the facility on a regular basis. All pipes can be managed and monitored using this website. You can self-regulate or control how often you water your plants using the options on this website. Usingthe Raspberry Pi camera, which can stream live from a website, you can keep an eye on the healthof your plants. The water flow sensor sends data about water flow to the controller through a wireless network. The controller examines this data to look for pipeline breaches. The usage of water is also restricted by weather forecasts, making it more predictable and effective. Shuchi Upadhyaya, Rajeev Tiwari, Arzeena Khan, and Dweepayan Mishra [2] Indians rely heavily on agriculture as a source of revenue, and it has a big effect on the country'seconomy. Increased exports and higher-quality products depend on crop growth. Consequently, a crop bed with excellent conditions and high humidity might significantly affect production. Pipes that are frequently used, including those that extend from one end to the other, are typically employed. This dispersion causes the field's moisture content to fluctuate. The water supply system can be strengthened with a well-designed water supply system. This study suggests a novel water system that will boost agricultural output and reduce labour costs. A humidity sensor, a Wi-Fi module, and an Arduino kit are all included in the device. Using the connections between our experimental research on the cloud. The required steps will then be taken when the data has been analysed by cloud services. B. Sridhar and R. Nageswara Rao [3] Agriculture plays a significant role in India's development as an agricultural nation. The growth of the nation has always been impacted by agriculture. The only way to overcome this difficulty is through intelligent agriculture, which includes modernising current agriculture. As a result, the suggested strategy aims to use automation and IoT technology to make farming smarter. The Internet of Things (IoT) enables a variety of applications, including crop selection and growth monitoring. Raspberry Pi-based system for autonomous control Crop productivity could be increased and improved with the help of IoT.

The project's major goal is to grow crops with the least amount of water possible. In order to concentrate on what water is available to their crops at the appropriate moment, farmers frequently spend a lot of time in the field. It is necessary to streamline complex circuitry and enhance water management. Using information gathered by sensors, the system intends to calculate water requirements. Two sensors record the soil's moisture and temperature each day, together with the humidity, temperature, and sun's temperature, and they relay the information to the central station. The planning approach should incorporate water storage

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based on these characteristics. The system's key benefit is the incorporation of Precision Agriculture 4 (PA) and cloud computing, which will help farmers increase crop yields while using less water and fertiliser and measuringthe weather in the field.

Required Equipment
Required Hardware:

- ESP8266 NODE MCU
- MCP3208 ADC IC
- PCF8574 GPIO Extender
- DHT11 Temperature and humidity sensor
- YL-64Sil
- soil moisture4 Conversion sensor
- YL-64S soil moisture
- Bridge rectifier
- LM 7805 voltage regulator
- Relay
- 2004 LCD Display
- Switch
- Motor
- PCB Board

Block Diagram:

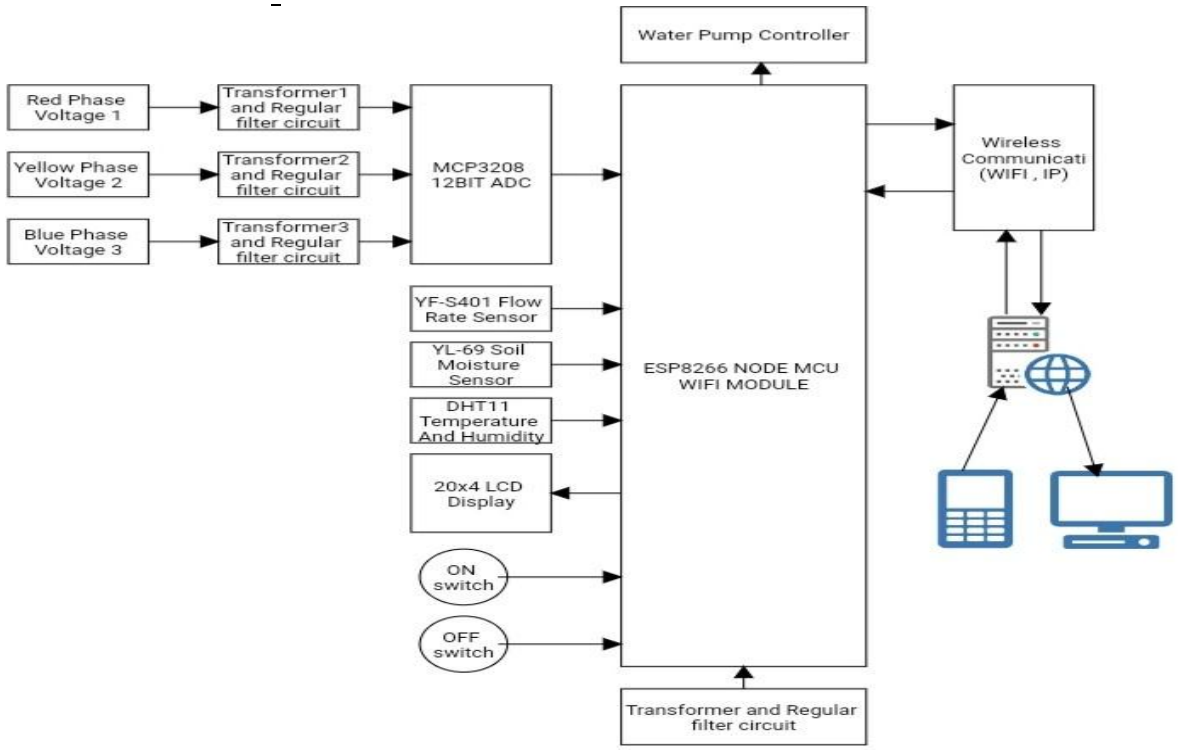

Figure 1 - Block Diagram

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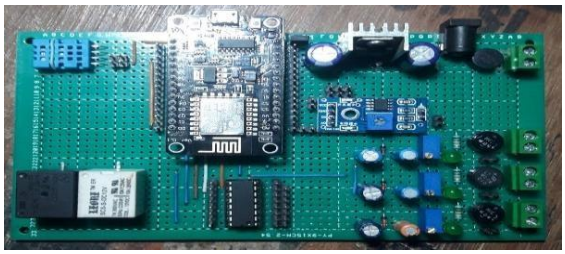
Recommended Approach:

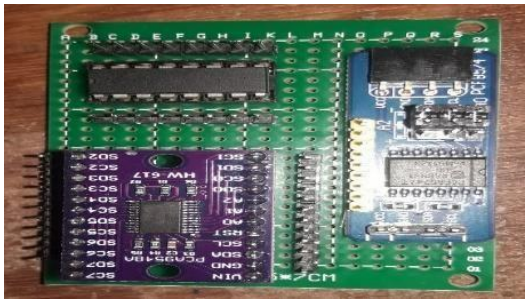
Our project is really designed for a solution but our farming system is designed to solve many problems, solutions are designed to solve this problem. So, we decided to make a project to solve this problem of all farmers and in this project we can solve many problems of farmers. Inthis project we used the ESP8266 node mcu to communicate with the web the main part of thisproject.

Steps to Make Hardware

a) Aluminium body frame

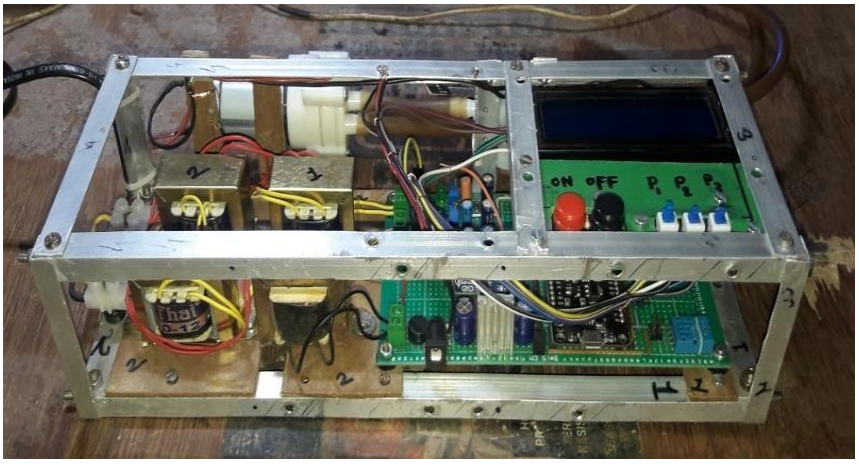


b) ESP8266 and sensor circuit



c) PCF8574 GPIO expansion circuit

d) Project latest model



a) Final hardware of this project

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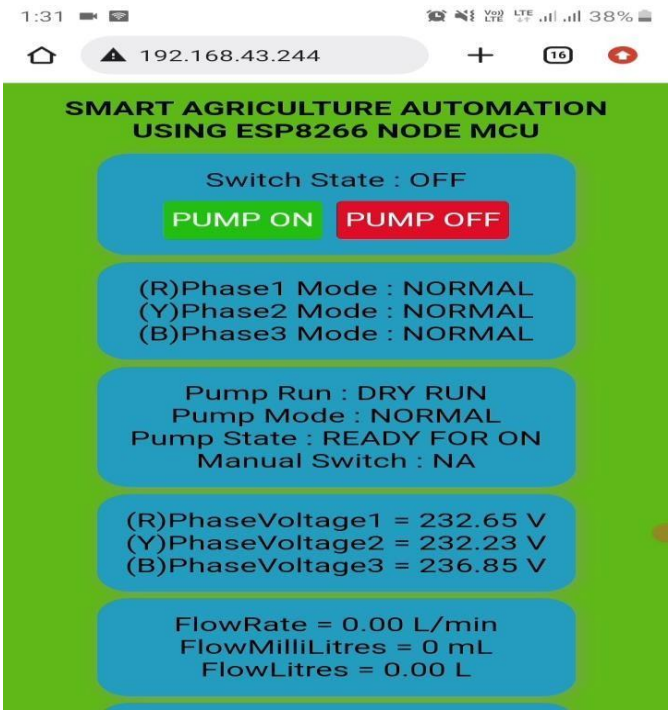
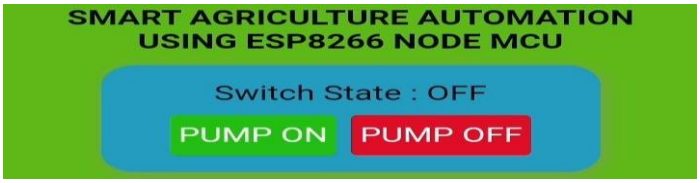
2. RESULT



b) Web page

web page Interface hardware and displays with 3-phase voltage, normal and high-level mode? Low mode indicates the Dry-Run or Water-running state of the pump, whether the pump is in normal or protection mode, the equipment shows manual change of flow, the water flow is in millilitres and litres, temperature and cold. Humidity is also measured; humidity is also displayed on the web page. All processes are running smoothly on website, evacuation process and Electrical equipmentare displayed correctly on website Condition of this project.

a) On off switch of water pump in website



b) Pump states

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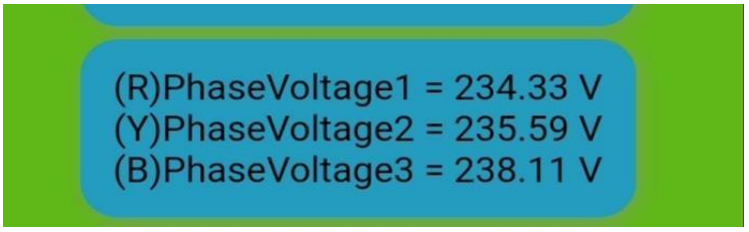
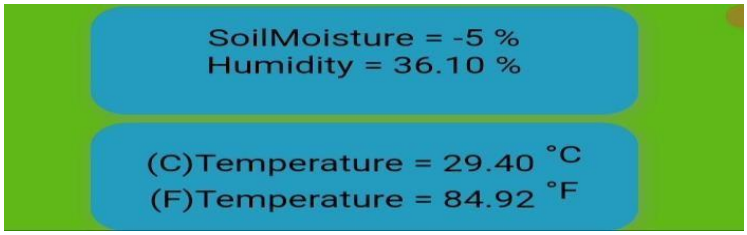
c) Three Phase voltages



d) Soil moisture, temperature and humidity



3. CONCLUSION

Is met Result In this concept system, the smart farm field automation system tests the three-phase voltage and other controls, making them more innovative, risk-minimizing, user-friendly and time-saving compared to existing systems. save energy and quality of plants, in agriculture. The smart farm automation system is seen as very useful as it works and controls the points, savese effort to control all parameters. The future of this system is moredirected towards the management of all agricultural activities.

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