iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** IV **Month of publication:** April 2023

DOI: https://doi.org/10.22214/ijraset.2023.51237

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue IV Apr 2023- Available at www.ijraset.com

Wireless Sensor Networks based Remote Monitoring System for Agriculture

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Abstract: ***The network covers a wide domain and addresses multiple aspects in agriculture, such as soil moisture, temperature, and humidity. Therefore, issues of precision agriculture at the output of the network are analyzed using wireless technology. The system is equipped with sensors for soil moisture and DHT11 for relative temperature and humidity. Current wireless sensor networks are widely used in a range of applications, such as precision agriculture, healthcare, and smart cities.***

I. INTRODUCTION

Rapid development of Internet networks has led to the introduction of the concept of "internet of things". The Internet of things is a broad term that describes how to connect various objects of everyday life over the Internet.

In the Internet-based principle, each object is connected to one another through a single network, so it can transmit data in the network without any interrelationship. IoT is recognized as a system based on data analysis in everyday life. IoT based on wireless sensor networks that are integrated with integrated systems for each object's interaction.

The main purpose of the sensor network is to connect devices to the global network. In the sensor network, each object is assigned a unique identifier, so each object can connect to the Internet.

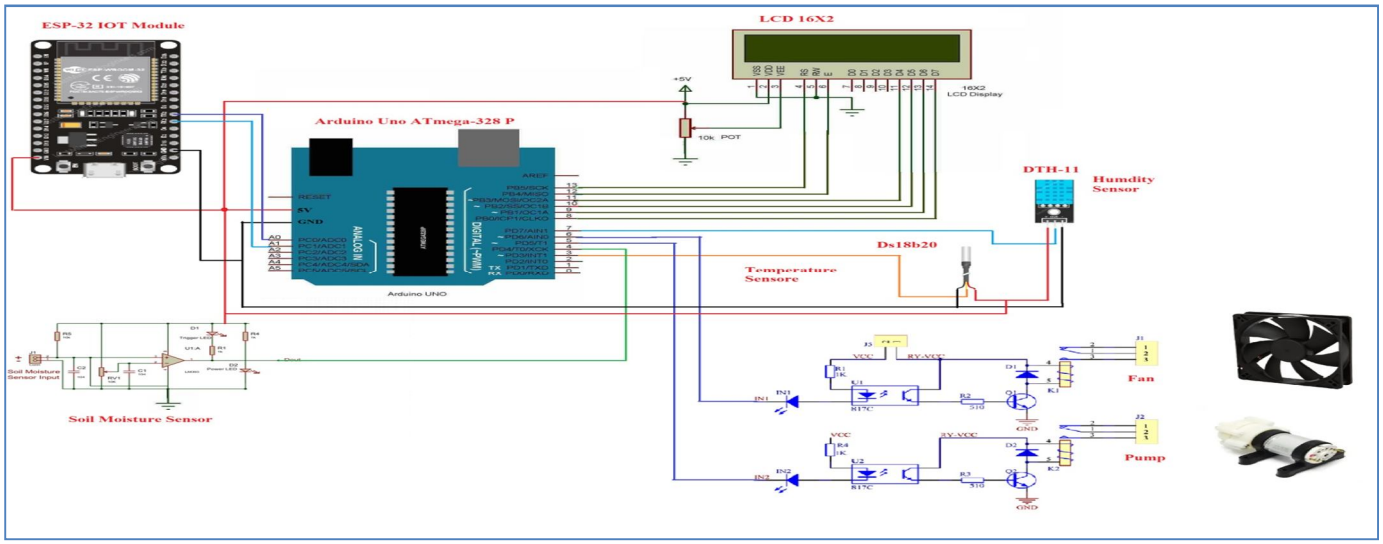
In present an implementation of a multi-hop wireless sensor network deployed in a bayberry greenhouse that collects temperature, humidity and light intensity measurements at a central gateway node which, in turn, transmits to a remote server.

II. APPARATUS REQUIRED

HARDWARE REQUIREMENT

1) Arduino MUC
2) 16X2 LCD
3) Temperature sensor
4) Humidity sensor

III. CONNECTION DIAGRAM



IV. RELATED WORK

The working principle of this system is simple. When the soil moisture sensor is placed in field it senses the condition and the comparator will compare with set value of potentiometer. If the value is less, than it will read as soil is dry and send signal to the Arduino. The Arduino commands the relay drive to close the circuit and switch ON the pump for supply of water. At the same time Arduino will display the status in the LCD display. If the value cross the set value of potentiometer, the Arduino again sends signal to relay driver to open the circuit to switch OFF the pump. At the same time LCD will display the soil status. Hence, the automatic system works. In the case of any failure in automatic system the pump also can be operate by switch but for that one have to visit in the field and ON the switch. After the irrigation is done again have to OFF the switch. Besides irrigating the field, pump also can be used during the cultivating land and other purpose through manual switch. Our system continuously monitors the humidity. Temperature and moisture content of soil. It can measure temperatures of soil or environment, based on the type of crop max temperature is predefined. If temperature goes beyond limit our system automatically activates the fan to reduce temperature it sends status over IOT.

If moisture content of soil is not enough our system gives command to pump for switched ON. Once moistures are enough automatically pump will switched OFF and sends status over IOT.

At remote side a person can check the status of every functionality anywhere in the world by phone or system by unique ID.

V. ADVANTAGES

1) No human intervenes need to turn and off motor.
2) Effective water saving
3) From using IOT can be monitored from worldwide**.**

VI. CONCLUSION

In the specific application needs of soil environmental monitoring system and analysis those problem existing in monitoring system, we designed and implemented a wireless sensor network based on the soil moisture temperature humidity monitoring system. The system can realize rapidly automatic networking and real-time data acquisition, transmission, display. With the characteristics of low cost, low power consumption, flexibility networking, without cabling, friendly interface, etc. Through IOT technologies, we can realize the function of the data networking, remote monitoring, it shows that the system can meet the requirements of the moisture, temperature and humidity of soil environmental.

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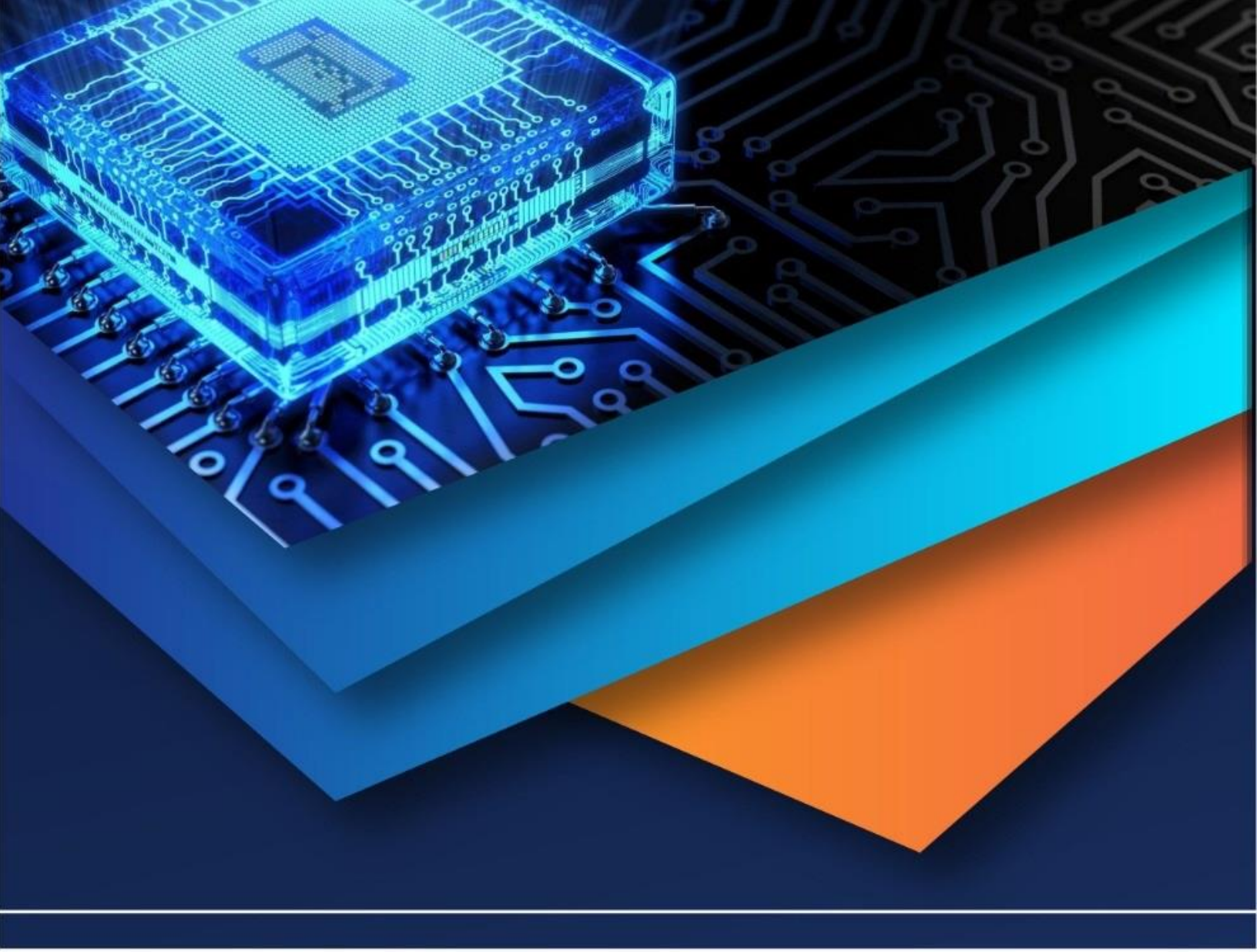

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