ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 07, Issue, 11, pp.16674-16676, November, 2017

ORIGINAL RESEARCH ARTICLE OPEN ACCESS

SMART AGRICULTURE USING AUTOMATION SYSTEM

***Rashmi Pawar and Jadhav, A. S.**

Department of E and E, B.L.D.E. A's V P Dr. P G Halakatti College of Engg., and Tech., Vijayapur, India

ARTICLE INFO

Article History:
Received 09th August 2017
Received in revised form
28th September, 2017
Accepted 11th October, 2017
Published online 29th November, 2017

Key Words:

Solar fence security, PIR live human detection, Automatic irrigation, microcontroller, Temperature sensor, Soil moisture sensor, Regulated power supply.

****Corresponding author:***

ABSTRACT

Irrigation system in India has given a high priority in economic development. Many new concepts are being developed to allow agricultural automation to flourish and deliver its full potential. Implementation of Hi-tech Agricultural Solar Fence Security with soil Humidity Based Automatic irrigation system and voice alert on PIR live Human Detection is been implemented in this project for safe and secure agriculture irrigation. The project irrigation control using AT89S52 is designed to tackle the problems of agricultural sector regarding irrigation system with available water resources. Prolonged periods of dry climatic conditions due to fluctuation in annual precipitation, may appreciably reduce the yield of the cultivation. The expenses in establishing many of these crops and their relative intolerance to drought make an effective irrigation system a necessity for profitable enterprises.

Citation: Rashmi Pawar and Jadhav, A. S. 2017. "Smart agriculture using automation system", *International Journal of Development Research*, 7, (11), 16674-16676.

INTRODUCTION

Agriculture is one of the most important aspects in our life. It is the only field, which maintains human life to survive in earth. Without food no one can able to live and we all get that through this. In this scientific world we can able to automate each and every process in order to reduce the manual workload and also the time consumption. It will be more useful if we introduce automation in this agricultural field. Here we are going to reduce the manual work due to irrigation through embedded systems. Irrigation is the key to a successful garden. Long gone are the days of manual watering or relying on a friend to water when you are on vocation or away on business. The project presented here waters your plants regularly when you are out for vocation. The circuit comprises sensor parts built using op-amp LM324. Op-amp is configured here as a comparator. Two stiff copper wires are inserted in the soil to sense the weather the soil is wet or dry .The comparator monitors the sensor and when sensor sense the dry condition then the project will switch on the motor and it will switch off the motor when sensor is wet. The comparator does the above job it receives the signals from the sensors. In this project we make use of micro controller for controlling the whole process. A small keyboard is used to set the time duration for opening a particular valve circuit. It consist of keys such as enter key, increment key and decrement key .By using these keys we set the percentage of pesticide and water which are applied to plants using water sprinklers.

MATERIALS AND METHODS

The automatic irrigation system was designed to continuously sense the moisture level of the soil. The system responds appropriately by watering the soil with the exact required amount of water and then shuts down the water supply when the required level of soil moisture is achieved. The reference level of soil moisture content was made to be adjustable for the three most common soil samples (sandy, loamy and clayey soils – the samples used for this project were taken from around the Covenant University EIE building, Nigeria) and the amount of irrigation. The moisture sensors were designed using probes made from corrosion-resistant material which can be stuck into soil sample. Voltage levels corresponding to the wet and dry states of the soil sample were computed by measuring the resistance between the moisture detector probes and matching them to output voltages of a comparator circuit. A submersible low-noise micro water pump was developed to deliver the water to the appropriate parts of the soil (the base of the plants).

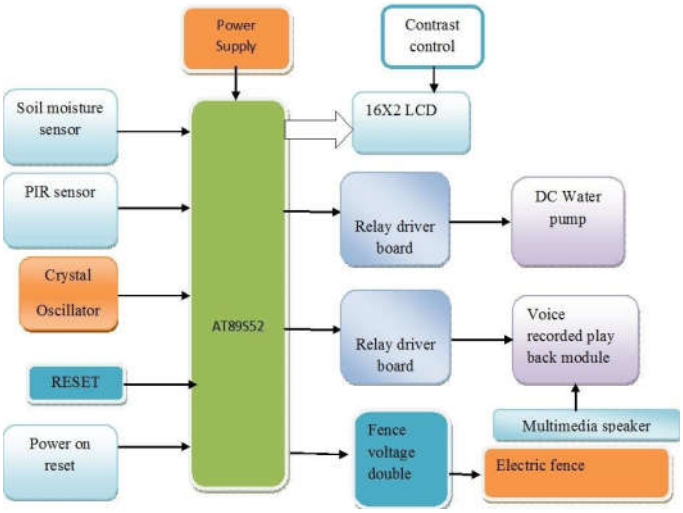

Fig. 1. Block diagram

The volume of water required for irrigation per time was computed by considering the capacity of the water pump and the water channels. The required irrigation time was determined by considering the response time of the water pump and the water volume required per irrigation instance. A timing circuit was designed to use the required irrigation time to control the duration of each irrigation instance. Simulations were done using Proteus™ circuit simulation software. Circuit construction was done on a Vero board. i.e. the volume of water delivered to the soil, will be adjustable by the system operator (mild, nominal and high levels). When an animal or human being comes into contact with the electric fence, they receive a sharp, short, painful but safe electric shock. The shock does not cause any physical damage. The electric fence acts as a strong psychological barrier as any intruder avoid coming into contact with the electric fence once they experience the shock. After a period of conditioning, the mere presence of the fence acts as an effective barrier even if it is not powered 'ON'. Electric fence can be made to detect a fault like shorting or cutting of the wire due to tampering on the fence with the alarm system.

A PIR sensor, or Passive Infrared sensor, is a type of detector that is capable of detecting infrared light emitting from objects within its field of view. PIR sensors differ from other infrared sensors because they are only able to receive infrared waves rather than being able to emit and receive them. Because all objects emit infrared (electromagnetic waves that travel with heat), PIR sensors are able to detect objects that are in front of them. In fact, PIR sensors can see many things that humans cannot. PIR sensors are used for a number of applications, such as night vision, motion detection, and laser range finding.
A microphone (colloquially called a mic or mike (both pronounced/mak/) is an acoustic-to-electric transducer or sensor that converts sound into an electrical signal. In 1876, Emile Berliner invented the first microphone used as a telephone voice transmitter. Microphones are used in many applications such as telephones, tape recorders, karaoke systems, hearing aids, motion picture production, live and recorded audio engineering, FRS radios, megaphones, in radio and television broadcasting and in computers for recording voice, speech recognition, VoIP, and for non-acoustic purposes such as ultrasonic checking or knock sensors.

Fig. 2. Switch is in open condition

Fig. 3. Switch is in closed condition

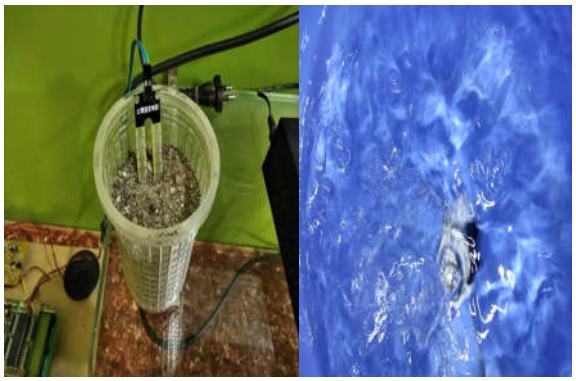

Fig.4. The sensor is dipped in the dry soil

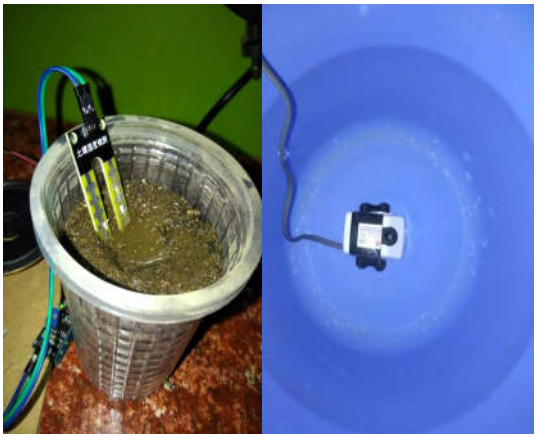

Fig. 5. The sensor is dipped in the wet soil

Table 1. Battery performance

Battery Draw	Output Wattage	Max Runtime
12V @ 1A	12 Watts	183 Hours
12V @ 2A	24 Watts	91 Hours
12V @ 4A	48 Watts	45 Hours
12V @ 8A	96 Watts	22 Hours
12V @ 16A	192 Watts	11 Hours
12V @ 32A	384 Watts	5 Hours
12V @ 183A	2196 Watts	1 Hour

A solar panel (photovoltaic module or photovoltaic panel) is a packaged interconnected assembly of solar cells, also known as *photovoltaic cells*. The solar panel can be used as a component of a larger photovoltaic system to generate and supply electricity in commercial and residential applications. Because a single solar panel can only produce a limited amount of power, many installations contain several panels. This is known as a photovoltaic array. A photovoltaic installation typically includes an array of solar panels, an inverter, batteries and interconnection wiring. Photovoltaic systems are used for either on- or off-grid applications, and on spacecraft. This provides a simple system that provides 12vDC output of 183 Amps. Adding additional batteries will increase the runtime in direct proportion to what is added. Insure that you do not overload your system.

RESULTS

Test for the solar electric fence

Switch is in open condition therefore no current flows through the fence and therefore we cannot observe spark when screw driver is made contact with the fence. When switch is closed current flows through the fence and therefore we can observe the spark when the screw driver is made contact with the fence.

Test for the automatic irrigation system

Sensor is dipped in the dry soil which makes the motor start and sprinkler irrigation takes place. When the sensor is dipped in the wet soil which makes the motor stop and sprinkler irrigation does'nt takes place.

Conclusion

Irrigation has been the backbone of human civilization since man has started agriculture. As the generation evolved, man developed many methods of irrigation to supply water to the land. In the present scenario on conservation of water is of high importance. Present work is attempts to save the natural resources available for human kind. By continuously monitoring the status of the soil, we can control the flow of water and thereby reduce the wastage. This project presents a high sensitive sensor based automotive device control. The tracking controller based on the closed loop algorithm is designed and implemented with Raspberry pi in embedded system domain. The proposed system can control devices automatically. Thus, the power can be saved. Experimental work has been carried out carefully. The proposed method is verified to be highly beneficial for all the electrical appliances.

REFERENCES

"Chicken and products", Division of General Merchandise Stores Department of Foreign Trade Ministry of Commerce, 2014, Department of Foreign Trade.

Based on GSM-SMS, IEEE 8th International Conference on Electronic Measurement and Instrument, 2007,pp. 45-82.

Benzekri, A., Meghriche, K., and Refoufi, L., PC-based automation of a multi-mode control for an irrigation system Proceedings of International symposium on industrial embedded systems, Lisbon, July 2007, pp. 310-315.

Fangmeier, D. D., Garrot, D. J.,Mancino, C.F and Husman, S. H., "Automated irrigation systems using plant and soil sensors", American Society of Agricultural Engineers, ASAE Publication, 1990, pp. 533-537.

Hathaichanok Ganggit, "Insights Smart Farmer a new concept", hailand will revolutionize farming, 2014.

Jaruwan Lualon, "Impacts of Bird Flu on Thai Frozen Poultry Export Industry to Major Market in Europe and Asia, 2002-2005", 2007, Dhurakij Pundit University.

Kay, M., "Smallholder irrigation technology: Prospects for sub-Saharan Africa" International Program for Technology and Research in Irrigation and Drainage, FAO, Rome, 2001, pp. 1–25.

Manakant Intarakamhaeng, "The Model Farm Management Automation Technology with RFID", 2008, Office of Science and Technology

Saifudaullah Md, Bahrudin Bin and Kassim. Rosni Abu, "Development of Fire Alarm System using Raspberry Pi and Arduino Uno.", 2013

Shah N. and I. Das, "Precision Irrigation Sensor Network Based Irrigation", a book on Problems, Perspectives and Challenges of Agricultural Water Management, IIT Bombay, India, pp. 217–232, April 2008

Shen Jin, Song Jingling, Han Qiuyan, Wang Shengde, and YangYan, School of Electric and Electronic Engineering, A Remote Measurement and Control System for Greenhouse

Shinghal, K., Noor, A., Srivastava, N., and Singh, R., Wireless sensor networks in agriculture for potato farming, *International Journal of Engineering, Science and Technology*, Vol. 2, No. 8, 2010, pp. 3955-3963.

****