International Journal of Advanced Research Methodology in Engineering & Technology, Special Issue March 2017, ISBN 978-1-63535-324-2

Drip Irrigation Using IOT and WebApplication

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ABSTRACT

The main intention is to develop an automation to supply water for home gardening and irrigation system in farm fields. It is done with the help of soil moisture sensor and temperature sensor which are fixed at root area of the plants. The values detected by these sensors are transmitted to the base station. The key aim of base station is to collect data from field station and upload those values in internet by using Wi-Fi technology also notify user about any peculiar circumstances like low moisture and high temperature. Drip irrigation system has been approved under different climates with various levels of moisture contents. Home gardening is the hobby of many people and also same works for the irrigation system in the agricultural fields.

KEYWORDS

ESP8266, Solenoid valve, wireless sensor network, Atmel atmega328p.

INTRODUCTION

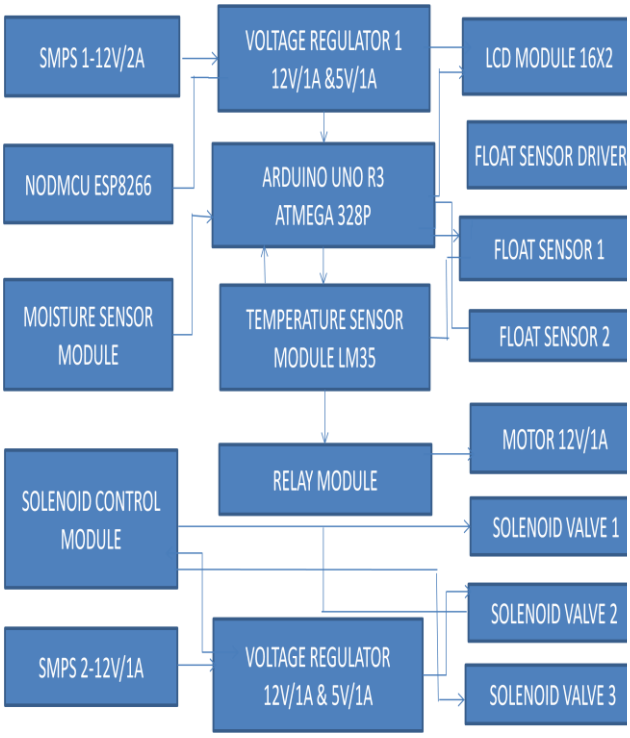
Agriculture is the primary occupation of Indians with 70% of its population living in villages. The depleting water resources are making agriculture undesirable occupation for many. Further the labor charges are in rising for farm maintenance while the yield is declining. Hence alternative methods for conserving water are to be produced at the same time monitoring the temperature, humidity in a field is also essential for plant growth and yield. The project proposes a novel method for irrigating the fields based on the Soil type, humidity, moisture and temperature. The system will include a Irrigation unit and parameter measuring unit receiving and posting information to a remote server by means of IOT. The user can choose the soil type to set up the irrigation unit. The Hardware unit consists of a motor, relay driver and values connected to a Atmel atmega328p microcontroller which is further connected to a ESP8266 module. The user interface includes a web application with details of soil type etc. The User interface will also provide the user with information including soil moisture, Temperature, humidity.

OPERATIONS PERFORMED

The function block diagram explains about the operation of drip irrigation using IOT and display the water level in the tank, temperature and moisture levels in the Liquid Crystal Display.

These all can be controlled by the software user interface. It will indicate the water level of the tank and the user can control the solenoid valve through that software user interface.

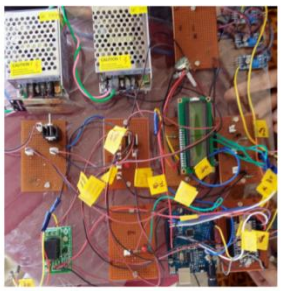
The user can choose the field according to the moisture level of the soil. This helps in understanding about the drip irrigation using IOT and Web Application.



Functional Block Diagram

The Figure1 shows how the automation of irrigation system is subsisting of two main blocks one is at field station and other is base station. To sync the sensed values in web ESP8266 is connected.

IMPLEMENTATION



Field station subsists of one main micro controller and three sensors temperature, float sensor and soil moisture is interfaced to it. The temperature and moisture of soil is measured at field station. The sensors are placed at root zone of the plants. The depth of setting sensors varies. It relies upon kind of the soil. The quantity of water that is appropriate for the field. Soil moisture sensor is used to review the potential of the soil. In case the field is said to be moist, we observe the conductivity to be high with low resistance. If the field is said to be dry, we inspect the conductivity to be low with high resistance. The microcontroller (atmega328p) reads the values and sends to base station using Wi-Fi module. The Wi-Fi receiver is connected to another microcontroller which is at base station. Wi-Fi module ESP8266 is connected to this microcontroller. ESP8266 searches for the Wi-Fi networks in nearby and connects to one of the authorized network, using that network the

values received at base station is uploaded in internet by means of static IP address. Using that address the user can verify the values at any place.

INTERNET OF THINGS (IOT)

Internet of Things (IoT) is a calculating approach that interprets a future where physical objects is connected to the internet and will identify themselves to other devices. In case we had mobile phones that knew everything there was to consider things using data they assembled with no help from us. User would have the ability to track and check everything and extraordinarily reduce waste, adversity and expense. We would know when thing required back up, repairing or checking on and whether they were new or past their best. Environmental monitoring is one of the applications of the IOT. Predominantly sensors are used to support in environmental protection by monitoring air, atmospheric, soil conditions and water quality.

SOFTWARE USER INTERFACE

RESULTS

The values are displayed which are received from sensing unit and transmitted via Wi-Fi module. Different values are monitored i.e. temperature and soil moisture. The received values are compared with set-point. If soil moisture value exceeds the set-point then the plant is said to be not in a good condition. Whenever the monitored values are more than the set point the water valve will be opened and water is applied to the plants. Wi-Fi module (ESP8266) which is interfaced to the microcontroller uploads the noted

values of temperature and soil moisture in web. This process is done based on ESP8266 Wi-Fi module. This module connected to microcontroller searches for available Wi-Fi networks and after authentication to that network it generates one static IP address. This address is used to monitoring of values by the user at any location. The set points may set based on the values acquired under various conditions. The set points may change from one place to another place since it may not be steady in each area. From the Wi-Fi receiver the values are received at mobile phone.

CONCLUSION

The automation in irrigation system applied was once located to be appropriate and price adequate for accessing water source of supply for agricultural management. This irrigation method permits farming in areas with water scarcity thereby making improvements to hold water. The irrigation system scheme can be conformed to an assortment of particular harvest needs and requires least preservation. The standard structure of the irrigation system which is automated permits it to be range up for bigger nurseries or open gardens. As the insistence for water increments, alongside the need to ensure floating natural surroundings, water protection rehearses for irrigation system should be powerful and moderate. Accuracy minimizing so as to water system will enhance irrigation system the misuse of water, and efficiency, while expand crop yields. The best strategy for deciding the water requests of harvests is based on the real time controlling of soil moisture.

ACKNOWLEDGMENTS

In particular, we acknowledge the efforts of my project guide Mr.M.Santhanaraj, the staff at the KPR Institute of Engineering and Technology who have committed

their time and enthusiasm to the project.

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