

WIFI BASED AGRICULTURE ENVIRONMENT MONITORING SYSTEM USING ANDROID MOBILE APPLICATION

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Dear sir/madamthis my B.Tech project

Abstract:

Agriculture is the primary occupation in our country for ages. But now due to migration of people from rural to urban there is hindrance in agriculture. So to overcome this problem we go for smart agriculture techniques using IoT. This project includes various features like Wi-Fi based monitoring, moisture & temperature sensing, intruders scaring, and proper irrigation facilities. It makes use of wireless sensor networks for noting the soil properties and environmental factors continuously. Various sensor nodes are deployed at different locations in the farm. Controlling these parameters are through any remote device or internet services and the operations are performed by interfacing sensors, Wi-Fi, with microcontroller. This concept is created as a product and given to the farmer's welfare

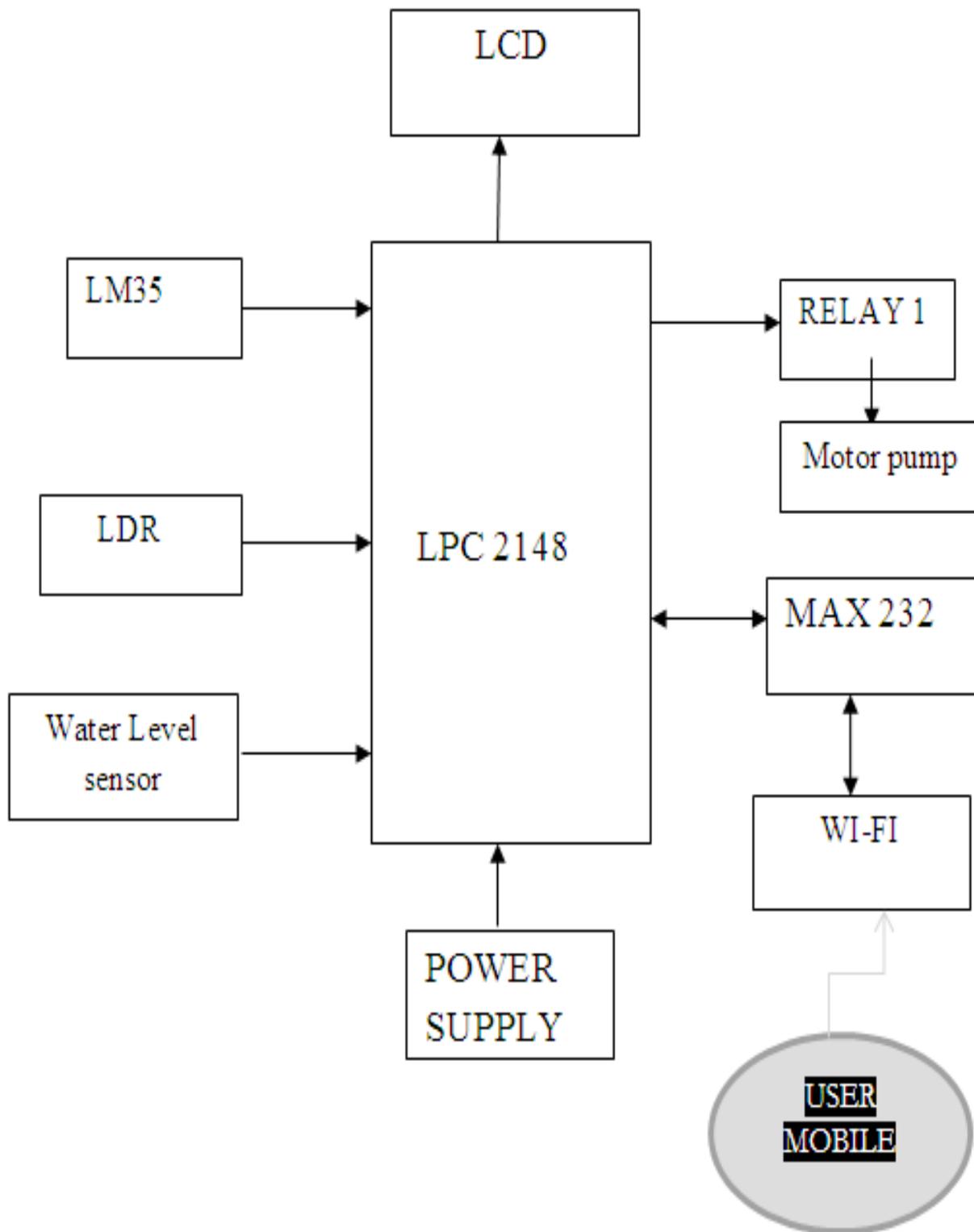
INTRODUCTION TO SMART AGRICULTURE:-

As the world is trending into new technologies and implementations it is a necessary goal to trend up in agriculture also. Many researches are done in the field of agriculture. Most projects signify the use of wireless sensor network collect data from different sensors deployed at various nodes and send it through the wireless protocol. The collected data provide the information about the various environmental factors. Monitoring the environmental factors is not the complete solution to increase the yield of crops. There are number of other factors that decrease the productivity to a greater extent. Hence automation must be implemented in agriculture to overcome these problems. So, in order to provide solution to all such problems, it is necessary to develop an integrated system which will take care of all factors affecting the productivity in every stage. But complete automation in agriculture is not achieved due to various issues. Though it is implemented in the research level it is not given to the farmers as a product to get benefitted from the resources. Hence this paper deals about developing smart agriculture using IoT and given to the farmers.

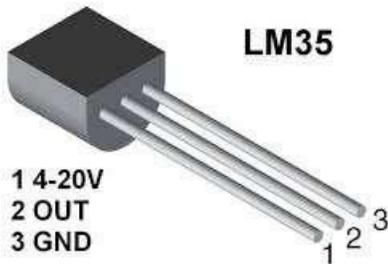
LITERATURE SERVEY:-

The existing method and one of the oldest ways in agriculture is the manual method of checking the parameters. In this method the farmers they themselves verify all the parameters and calculate the readings. [1]It focuses on developing devices and tools to manage, display and alert the users using the advantages of a wireless sensor network system. [2]It aims at making agriculture smart using automation and IoT technologies. The highlighting features are smart GPS based remote controlled robot to perform tasks like weeding, spraying, moisture sensing, human detection and keeping vigilance.

Block Diagram:

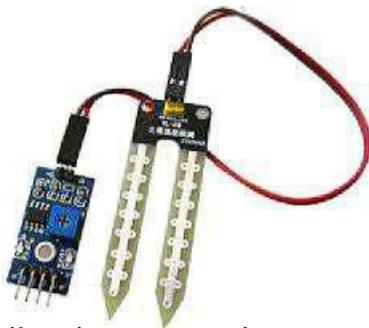


TEMPERATURE SENSOR



The LM 35 sensor is highly used because its output voltage is linear with the Celsius scaling of temperature. It does not provide any external trimming. It has a wide operating range. The maximum output is 5V. The output will increase 10mV for every one degree rise in temperature. The range is from -55 degrees to +150 degrees. There are three terminals as vcc, Ground and the analog sensor. It consumes minimum amount of electricity. Thus, it is energy efficient. It is very efficient in horticulture. It is user friendly to use.

SOIL MOISTURE SENSOR



Soil moisture sensor is a sensor which senses the moisture content of the soil. The sensor has both the analog and the digital output. The digital output is fixed and the analog output threshold can be varied. It works on the principle of open and short circuit. The output is high or low indicated by the LED. When the soil is dry, the current will not pass through it and so it will act as open circuit. Hence the output is said to be maximum. When the soil is wet, the

current will pass from one terminal to the other and the circuit is said to be short and the output will be zero.

The sensor is platinum coated to make the efficiency high. The range of sensing is also high. It is anti-rust and so the sensor has long life which will afford the farmer at a minimum cost.

Light Dependent Resistor

Light sensor is used to detect light intensity of environment. Light is major source for crops which is responsible for photosynthesis fig 3.3. Light dependent resistor is used in resistivity decreases with increases in high intensity and vice versa. The voltage divider circuit is designed to measure resistance due to light intensity variations. The voltage level increases with increase in light intensity. The analog reading is taken from board. It is used in green house where artificial lighting is done using any of the incandescent lamps, fluorescent lamps instead of sunlight.

WI-FI Module

The ESP8266 Wi-Fi Module is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor.

RELAY:-



A relay is an electrically operated switch. A type of relay that can handle the high power required to directly control an electric motor or other loads is called a contactor. Solid state relay control power circuits with no moving parts, instead using a semiconductor device to perform switching.

Agriculture Field Monitoring

Instead of observing the productivity and quality of farming all the time, this paper proposes the design to monitor these same attributes using wireless sensor network. For the growth, quality and productivity of crops in agriculture temperature, humidity and carbon dioxide levels are the most important climatic parameters. Moreover, when a critical change in one of the measurements occurs, then the farmer will be acknowledged via SMS and e-mail by an agriculture expert

Environment Monitoring System

There are various problems in the traditional agriculture like weak real-time data acquisition, limitations in monitoring area, excessive manpower etc., The system collects various climatic parameters like temperature, light and soil etc. From greenhouse and from there it transmits the data to nearest server via wi-fi module. The system includes a web application which is using to show the

greenhouse status. Since, This results that low power system has better scalability and can provide better service

PROTEUS 8 SIMULATOR

Proteus 8 is one of the best simulation software for various circuit designs of microcontroller. It has almost all microcontrollers and electronic components readily available in it and hence it is widely used simulator.

It can be used to test programs and embedded designs for electronics before actual hardware testing. The simulation of programming of microcontroller can also be done in Proteus. Simulation avoids the risk of damaging hardware due to wrong design.

EXPERIMENTATION & RESULTS

The hardware is interfaced with all the sensors in the board. The hardware components include the microcontroller, buzzer, relay, inbuilt ADC converter in lpc2148, Esp8266 module and all the sensors interfaced.

The output shown below denotes the temperature, soil moisture condition and the ldr detection. The second result is the output from the Android Application that is developed in the mobile phone. It determines the temperature, ldr, moisture detection.

FUTURE WORK & CONCLUSION

For future developments it can be enhanced by developing this system for large acres of land. Also the system can be integrated to check the quality of the soil and the growth of crop in each soil. The sensors and microcontroller

are successfully interfaced and wireless communication is achieved between various nodes. All observations and experimental tests prove that this project is a complete solution to field activities and irrigation problems. Implementation of such a system in the field can definitely help to improve the yield of the crops and overall production.

Implementation

In this implementation model we used LPC2148 board, Sensors and ESP8266 Wi-Fi module as an embedded device for sensing and storing the data in to cloud. Wi-Fi module connects the embedded device to internet.

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