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DESIGN AND IMPLEMENTATION OF EMBEDDED SYSTEM FOR MONITORINGANDAUTOMATIC CONTROLLING A GREEN HOUSE IN A FIELD

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I. INTRODUCTION

The Internet of Things (IOTs) can be described as connecting everyday objects like smart-phones, Internet TVs, sensors and actuators to the Internet where the devices are intelligently linked together enabling new forms of communication between things and people, and between things themselves. Building IOTs has advanced significantly in the last couple of years since it has added a new dimension to the world of information and communication technologies. The internet of Things (IOT) is a recent communication paradigm that envisions a near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the internet". The IOT improvement of learning circumstance that make use of the huge subject data generated by those objects to provide dynamic services to teachers, learners and even to content developers in modern Campus. Smart campus enables us to use IOT methodologies to make it available for farmers. The paper aims to create smart agriculture fields with shows field temp,Soil moisture or humidity using website-based applications (software) which allow us to share via IOT enabled medium to accesses within network limit. This paper seeks the developments of a model which describe architecture of IOT enabled smart field and communication between smart farmer & farm. The main objective of this paper is to discuss a way of utilizing IOT technology for an agriculture fieldin which data collection can be possible by using devices for e-farming application in real-time.

Keywords: AC/DC Pump Motor, NODEMCU ESP8266 Wi - Fi Module, Relay, Sensors, Sprinklers.

II. OVERALL SYSTEM ARCHITECTURE

Building a wireless sensor network system requires development and integration of many hardware and software components. Figure 1 shows the overallsystem architecture of an environmental monitoring wireless sensor network system that we have developed.

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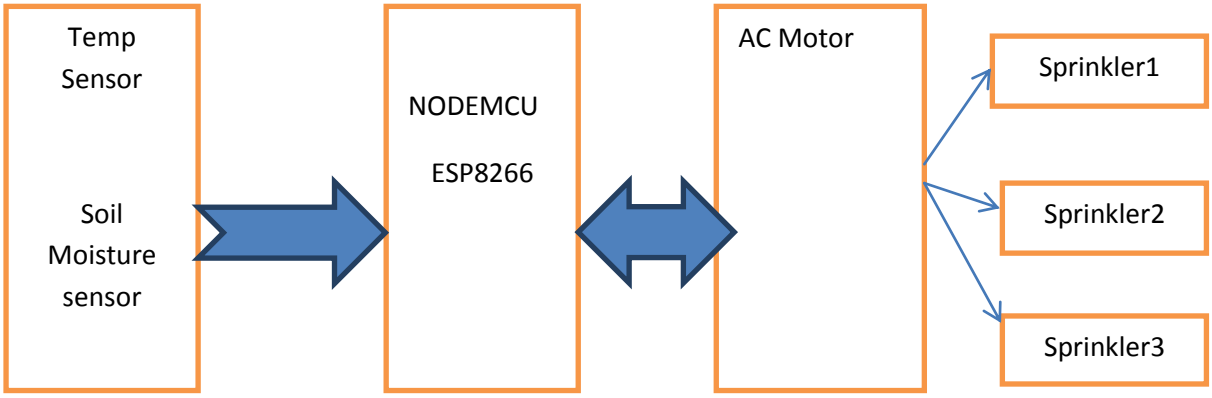
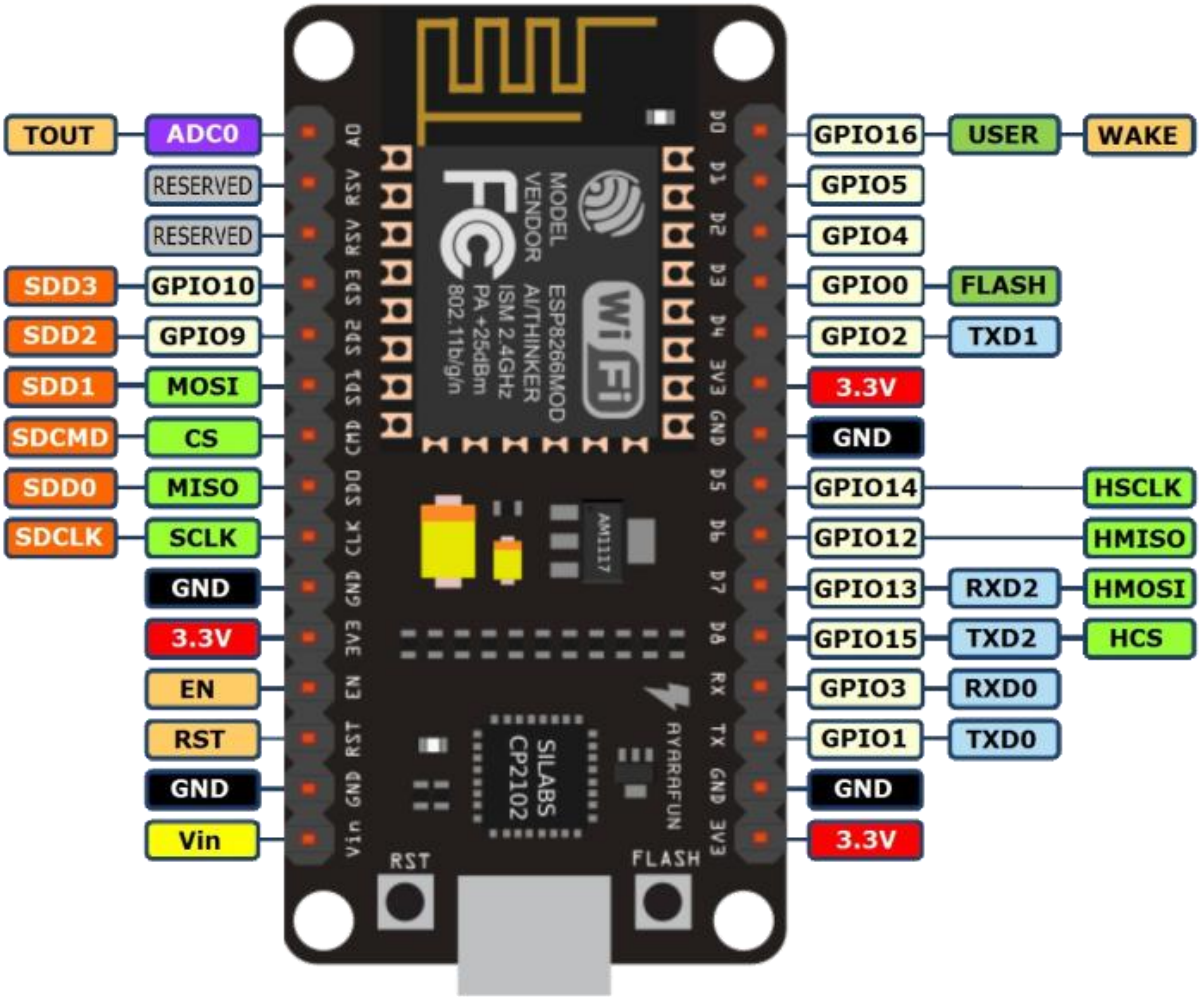


Multiplexer **Microcontroller &Wi-Fi Module**

NODEMCU (ESP 8266):-



Node MCU is an open-source IOT platform. It includes firmware which runs on the ESP8266 Wi-Fi SOC from expressive systems and hardware which is based on the ESP-12 module. The term NodeMCUby default refers to

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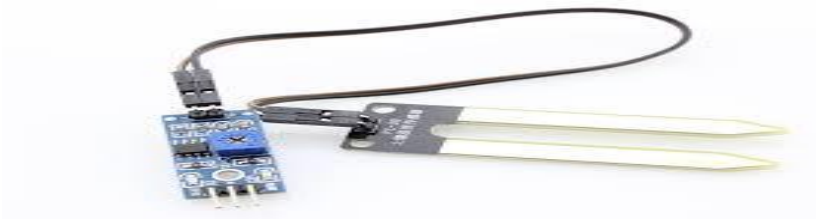
the firmware rather than the development kits. The firmware uses the LUA scripting language.The development kit based on ESP8266 intimates GPIO, PWM and ADC all in one board.

SOIL SENSOR



Probe is feedback instrument of the automated irrigation system. It used to measure moisture content of the soil. It is to be placed permanently. When it's getting activated, means of 5v supply then it sends electrical outputsignals which is given to the comparator circuit. This comparator circuit reads the signals, whose output is given to microcontroller.

TEMPERATURE SENSOR

The LM35 is a low voltage IC which uses approximately +5VDC of power. This is ideal because the NodeMCU power pin gives out 5V of power. The IC has just 3 pins, 2 for the power supply and one for the analog output. The output pin provides an analog voltage output that is linearly proportional to the Celsius (centigrade) temperature. Pin 2 gives an output of 1 milli-volt per 0.1°C (10mV per degree). So to get the degree value in Celsius, all that must be done is to take the voltage output and divide it by 10 this give out the value degrees in Celsius

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SPRINKLER SYSTEM

Sprinkler irrigation is a method of applying irrigation water which is similar to natural rainfall. Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air through sprinklers so that it breaks up into small water drops which fall to the ground. Irrigation sprinklers are sprinklers providing irrigation to agriculture, crops, vegetation, or for recreation, as a cooling system, or for the control of airborne dust, landscaping and golf courses. The sprinkler system irrigates the field and thus it is widely used in sandy areas as it checks the wastage of water through seepage and evaporation. Sprinkler irrigation is a method of applying irrigation water which is similar to natural rainfall. Water is distributed through a system of pipes usually by pumping. It is then sprayed into the air through sprinklers so that it breaks up into small water drops which fall to the ground. The pump supply system, sprinklers and operating conditions must be designed to enable a uniform application of waterthe system includes a number of distributed wireless sensor nodes. Each sensor node is a combination of sensors, microcontroller (uC), and Wi-Fi transceiver

III. IMPLEMENTATIONSETUP

When the connection is established it will start reading the parameters of sensors. The threshold levels for the required sensors are set and are later monitored and compared. The sensor data are sent to the website server and stored in the cloud. The data can be analysed anywhere any time. A model field is built for the agriculture automation system and is as shown in the figure 1. When the farm soil moisture exceeds the set threshold and in turn on the motor increases the moisture level through Sprinklers. NodeMCU is connected with the antennas for the connectivity with internet.

IV. PROPOSED SYSTEM FEATURE

The proposed system is a distributed agriculture automation system, consists of server, sensors. Server controls and monitors the various sensors, and can be easily configured to handle more hardware interface module (sensors). The NodeMCU development board acts as website server. Automation System can be accessed from

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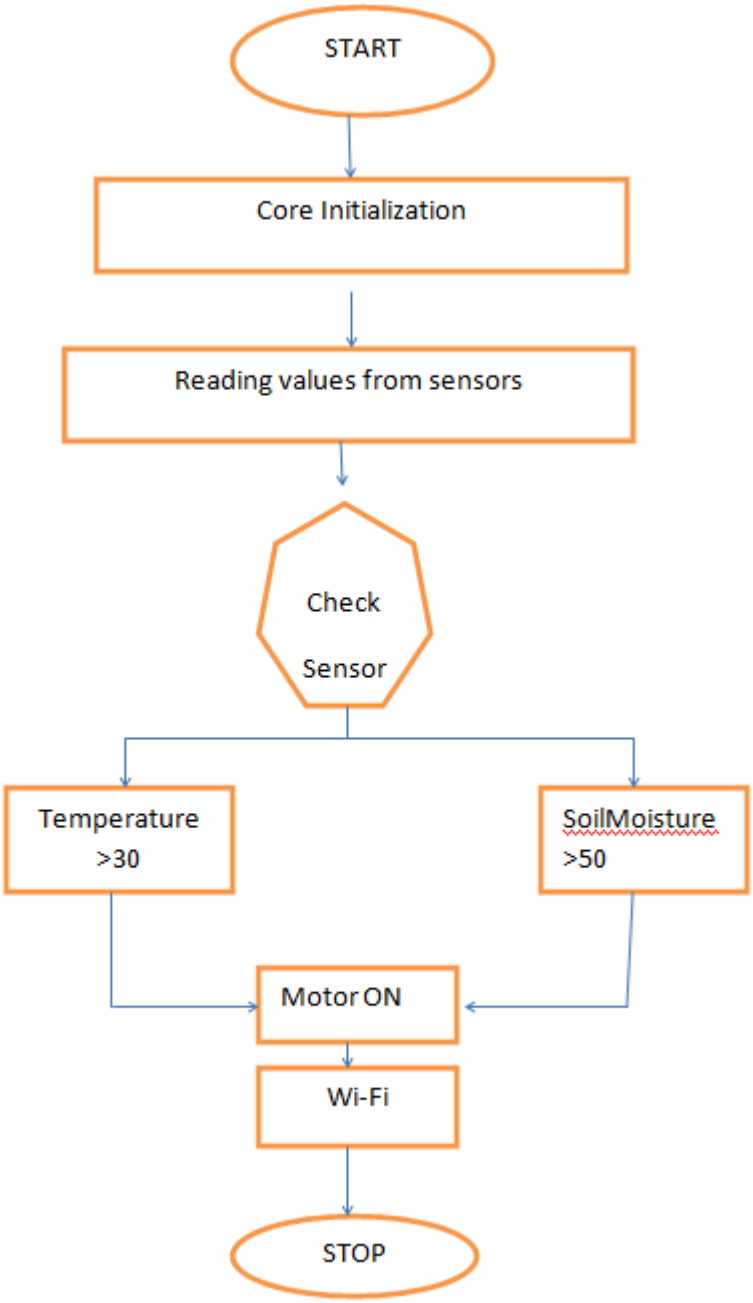
the website browser of any local PC in the same LAN using server IP, or remotely from any PC or mobile handheld device connected to the internet with appropriate website browser through server real IP (Internet Protocol). Wi-Fi technology is selected to be the network infrastructure that connects server and the sensors. Wi-Fi is chosen to improve system security (by using secure Wi-Fi connection), and to increase system.

V. FLOW CHART



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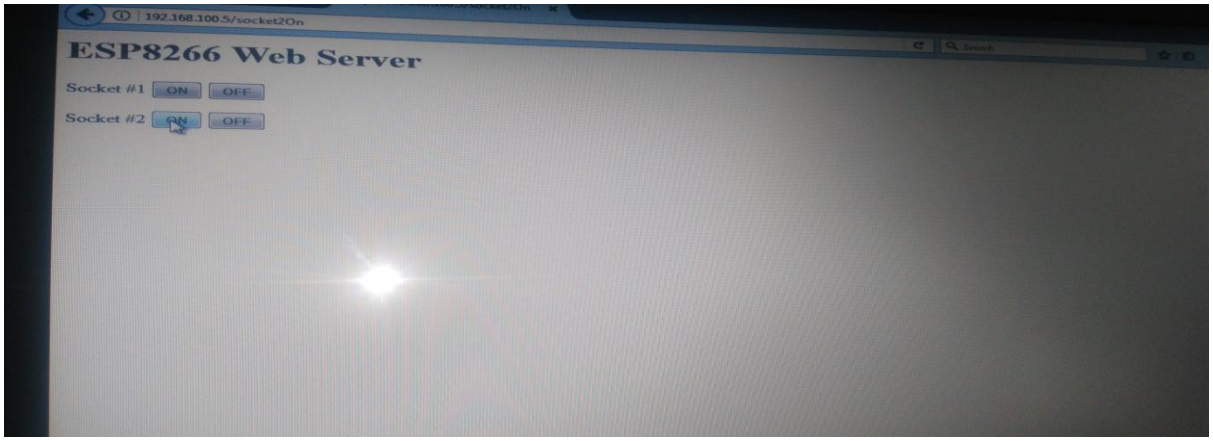
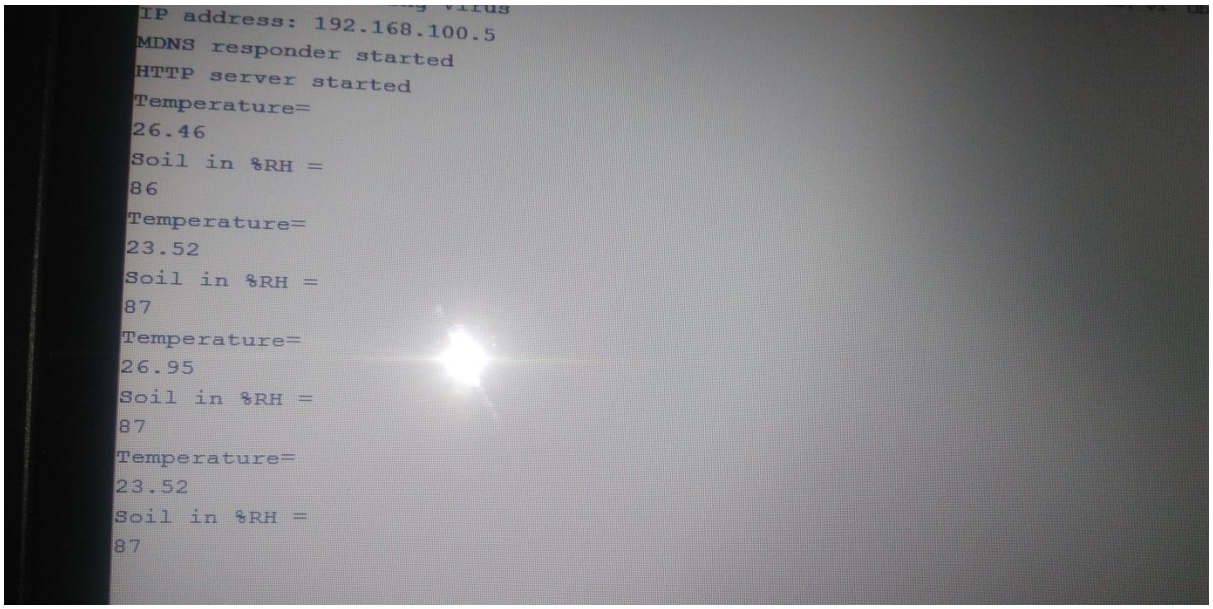
VI. RESULTS





VII CONCLUSION AND FUTURE SCOPE

In present days especially farmers are facing major problems in watering their agriculture fields, it's because they have no proper idea about when the power is available so that they can pump water .Even after then they need to wait until the field is properly watered, which makes them to stop doing other activities. Here is an idea which helps not only farmers even for watering the gardens also, which senses the soil moisture and switches the pump automatically when the power is ON The working of project is basically dependent on the output of the soil moisture sensors. Whenever there is need of excess water in the desired field then it will not be possible by using sensor technology. For this we will have to adopt the DTMFtechnology. By using this we will be able to irrigate the desired field and in desired amount in future use.

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