

IoT Technology for Remote Control Watering System

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ABSTRACT: In this paper both monitoring and control process of water is possible. This experiment is a particular case that could determine the soil moisture, plant growth and amount of co₂ present around the plant and allowing the studies of the best controller algorithm to save water. The water consumption log can be monitor in real life and served to any user as a distributed remote laboratory with a support of LAN connection adaptive algorithm.

KEYWORDS: Microcontroller, LCD display, Android wireless LAN, Transceiver, TCP client.

I. INTRODUCTION

An embedded system is a special purpose computer system built in to an environment connected to systems through sensors, and other interfaces. Embedded system must meet timing and other constraints imposed on it by environment. Embedded systems control many devices in common use today. In recent years, as the size and cost of mobile robots have decreased significantly, they are finding increasing uses in home environments.

Various home robots have been proposed to do housework such as cooking, cleaning, house plant watering, pet feeding and taking care of children. Although most of the current home security systems can work normally, it is inconvenient to deploy and maintain a lot of sensors and accessories everywhere in the rooms with the rapid development of microelectronics and wireless communication technologies, mobile robots, are being widely used in industrial automation, home automation, hospitals, entertainment, exploration, military, etc.

In this project, a lot of water is saved from being wasted. The system proposes remote monitoring and control system based on GSM. GSM network is a medium for transmitting the remote signals and communication takes place between monitoring centre and remote monitoring station.

The sensor nodes uses radio signal for communication and they are self organized after deployed a base station acts like an interface between users and the network. Due to over population many water related problems like water pollution, wastage of water, water scarcity etc is arising day by day. Monitoring and controlling water level in the reservoir is an important task in homes and offices in order to reduce wastage of water.

To avoid one such problem of reducing water level and saving the plant we have developed an IoT technology for remote controlled watering system. The information about the plant's moisture, growth condition, co₂ level is transferred to the mobile through wireless technology. The command from the receiver is resend to the sender side.

This problem is quietly related to poor water allocation, inefficient use, and lack of adequate and integrated water management. Therefore, efficient use and water monitoring are potential constraint for home or office water management system. Every living thing on earth needs water to survive. Human bodies are made up of more than 60 percent water.

II. BLOCK DIAGRAM AND DISCRPTION

In this section, we have discussed the design of our proposal “IoT Technology For Remote Controlled Watering System”. It consist of the major units; Sensor, microcontroller, display unit, IoT module.

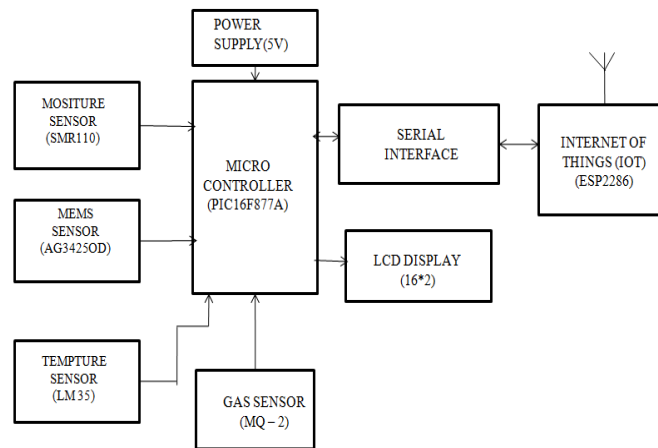


Fig 1 Proposed Block Diagram

Microcontroller is the heart of any circuit design. Here we have used PIC16F877 microcontroller or simply PIC which is a member of atmga family and an advanced version of at89c52. It has a set of serial transmission and receiver pins, I/O ports and timers, which are the basic requirements system proposed . It also has inbuilt analog to digital converters and requires easier programming than other microcontrollers.

Depending upon the water level in the soil the sensor sense a signal to the microcontroller which produces an encoding signal to be sent over GSM transceiver serially. At the receivers end the microcontroller receives a signal from the GSM transceiver module and depending upon the signal received it decides whether to turn motor OFF or ON depending upon the level of water in the soil.

Micro electro mechanical systems are miniature devices comprising of integrated mechanical and electrical component design to work in concert to, sense and report on the physical properties of their immediate or local environment.

MEMS- enabled functionality in everyday life are airbag deployment in automobiles; motion and orientation deduction in smart phones; and blood pressure measurement in catheters. MEMS sensor monitors the plant in X, Y, Z axis and also determines the growth of the plant in order to detect the plants dislocation, defects that occurred in plant due to disasters.

The Grove sensor module is useful for gas leakage deduction and it is suitable for deducting H₂, LPG, CH₄, CO, ALCOHOL, and SMOKE. Due to its high sensitivity and fast response time, and measurements can be taken as soon as possible. The sensitivity of the sensor can be adjusted by using potentiometer.

Firstly the raw water is treated with alum and chlorine through the aerator. Here the manual technique of opening and closing of the valves in the existing system which results in inappropriate amount of release of alum into the raw water is replaced by automatic open and close of valves with the help of different controllers. Here the filtration is done automatically.

III. CONCLUSION

In this paper we have explained the design and implementation of a simple, reliable and cost effective automatic water level control circuit. This circuit can be mainly implemented in offices and buildings and can cover an area of 50-100m. For covering larger distances LAN based water level controller can be used but it can be expensive. RF based water level controllers are present in the market which cannot send serial data and are used for short distance purposes. It is observed that the offices and households are the main areas of water wastage. So, constant monitoring and control of water level in the overhead tank is required. It has no problem of wire breakage after the installation is complete. It can also be employed for water leakage, detection is find using the water level.



Fig 2 Gas Sensor Output



Fig 3 Temperature Sensor Output

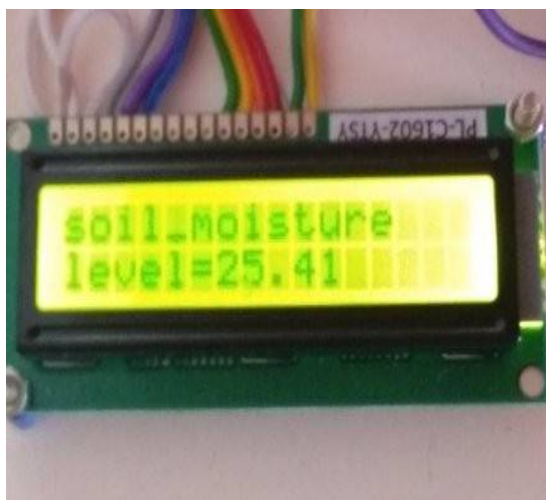


Fig 4 Moisture Sensor Output



Fig 5 MEMS Sensor Output

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192.168.4.1:80
Connected
soil_moisture_level=0.0temperature33.p
lantposition-3.soil_moisture_level=3.1te
mperature33.plantposition-4.soil_mois
ture_level=0.0temperature33.plantposi
tion-4.soil_moisture_level=0.0temperatu
re33.plantposition-4.soil_moistureleve
l=20.temperature33.plantposition3.0soi
l_moisture_level=17.temperature33.plan
tposition-5.soil_moisture_level=22.tem
perature33.plantposition-5.soil_moisture
_level=24.temperature33.plantposition-
5.soil_moisture_level=24.temperature33
.plantposition-5.soil_moisture_level=21
.temperature33.plantposition-7.soil_moi
sture_level=21.temperature33.plantposi
tion-6.soil_moisture_level=0.0temperatu
re33.plantposition-6.soil_moistureleve
l=19.CO2_level_ubnormaltemperature33.
plantposition-6.soil_moisture_level=17.t
emperature33.plantposition-6.soil_mois
ture_level=0.0
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Fig 6 TCP Client Output

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