

“Irrigation Control System Using GSM for Efficient Use of Water”.

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Abstract: The motivation behind this project came from the countries where economy is based on agriculture and the climatic conditions lead to lack of rains & scarcity of water. The farmers working in the farm lands are solely dependent on the rains and bore wells for irrigation of the land. Even if the farmland has a water-pump, manual intervention by farmers is required to turn the pump ON/OFF whenever needed. In this paper we tried to minimize this manual intervention by the farmer. In recent times, the farmers have been using irrigation technique through the manual control in which the farmers irrigate the land at regular intervals by turning the water-pump ON/OFF when required. This process sometimes consumes more water and sometimes the water supply to the land is delayed due to which the crops dry out. Therefore in this paper we use an Android application which helps the farmer to ON/OFF the motor without their physical presence in the field. This application can also detect the moisture level of soil; it can determine the saline content of soil and water.

Key Words: GSM module, Micro controller, Irrigation Control System

1. INTRODUCTION:

India is basically an agricultural country, and all its resources depend on the agricultural output. With the rapid development of agriculture in India, many automatic technologies have been introduced into agricultural productions. The total rainfall in a particular area may be either insufficient, or ill-timed. In order to get the maximum yield, it is essential to supply the optimum quantity of water, and maintain correct timing of water. This is possible only through a systematic irrigation system by collecting water during the periods of excess rainfall and releasing it to the crop as and when it is needed. [2] It is also possible to maintain the moisture level of soil and water. Irrigation is the science of planning and designing an efficient, low-cost, time efficient, reduces man power, economic irrigation system tailored to fit natural conditions. By the construction of proper distribution system, the yield of crop increased because of this efficient android application.

2. EXISTING SYSTEM:

In recent decades the increasing demands of food supplies required a rapid improvement in food production technology in many countries. In many countries where agriculture plays important role in shaping of the economic and climatic condition are isotropic, but still we are not able to make full use of agricultural resources.

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One of the main reasons is the lack of rains scarcity of land reservoir. Extraction of water at regular intervals from earth is reducing water level as a result of which the zones of un-irrigated land are gradually increasing. Water is supplied only when the moisture in the soil goes below preset threshold value. This saves a lot of water in recent times the farmer have been using irrigation technique through manual control in which the farmers irrigate the land at regular interval by turning water pump ON/OFF when required. This process sometimes consumes more water and sometimes the water supplied to the land is delayed due to which the crops dry out. Water deficiency deteriorates plants growth before visible wilting occurs. In addition to the slowed growth rate, lighter weight fruit follows water deficiency. This problem can be perfectly rectified if we use Irrigation Control System Using GSM for Efficient Use of Water. [2]

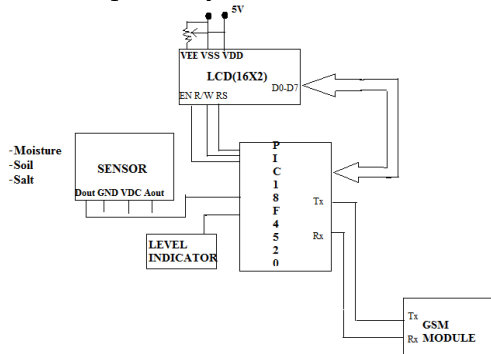
3. PROBLEM STATEMENT:

“Irrigation Control System Using GSM for Efficient Use of Water” is based on concept of mechatronics. In recent years research is on GSM based automatic motor control and protection system using SMS service but the service is not reliable and efficient. Therefore this paper is focus on to modify the SMS service and improve the use of proposed system using android application.

4. PROPOSED SYSTEM:

Considering the characteristics of irrigation in rural area of India. This paper is going to bring forward modified devices based on wireless network and radio communication. Three levels are included in the system: the android control platform or a android cellphone for

surveillance, the controller and action unit (sensors and detectors). Orders can be send from the android control platform or cellphone to the controller an information such as soil moisture, saline content, water level processed by the controller can be send to the android platform or cellphone by GSM module.



5. SYSTEM REQUIREMENTS:

Domain: Embedded System.

Hardware Interface:

Micro controller-PIC18F4520:

The PIC18F4520 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory. The device is manufactured

. Using Atmel’s high-density nonvolatile memory technology and is compatible with the industry- standard 80C51 instruction set and pin out.

Features:

- 8K Bytes of In-System Programmable (ISP) Flash Memory
- 8-Bit microcontroller
- 5V Operating supply , 1A current
- -55° C to +150° C storage temperature
- 10 Bit ADC, 8 channel
- 256 byte EEPROM
- 368 byte RAM
- 32 Programmable I/O Lines
- Full Duplex UART Serial Channel
- Operating Frequency: DC-20MHz
- Reset: POR, BOR

GSM modem:

GSM modem (900/1800 MHz) Semen’s GSM/GPRS Smart Modem is a multi-functional, ready to use, rugged unit that can be embedded or plugged into any application. The Smart Modem can be controlled and customized to various levels by using the standard AT commands. The modem is fully type-approved, it can speed up the operational time with full range of Voice,

Data, Fax and Short Messages (Point to Point and Cell Broadcast), the modem also supports GPRS (Class 2*) for spontaneous data transfer. Description of the interfaces The modem comprises several interfaces: - LED Function including operating Status - External antenna (via SMA) - Serial and control link - Power Supply (Via 2 pin Phoenix tm contact) - SIM card holder

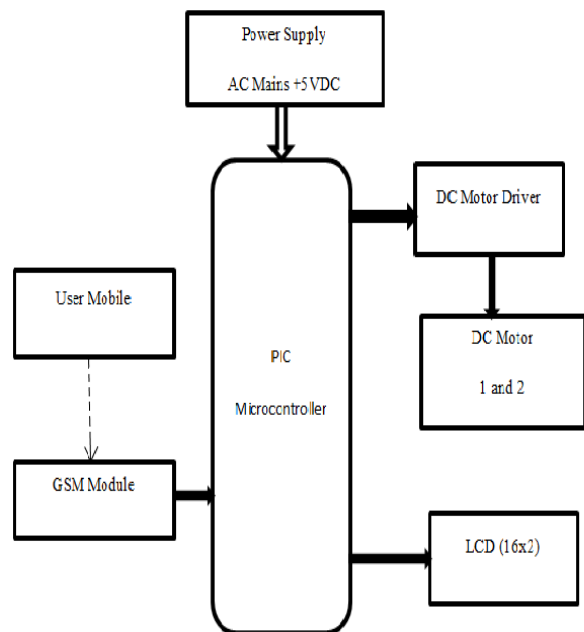
Soil moisture sensor (VG400):

This sensor is one of the main parts of our project. It takes its input from the soil. It will analyze the moisture content of soil; the sensor would give an analog input to ADC inside PIC18F4520 Microcontroller. The ADC which is one of the most important in build feature of the PIC18F4520 Microcontroller; samples this analog input value given by sensor into a digital output and stores it into one of its register.

Water level indicator circuit:

The simple water level indicator circuit presented here makes the system automatic , i.e. it switches ON the pump when water level in the overhead tank goes low and switches OFF as soon as the water level reaches a predetermine level. It also prevents ‘dry run’ of the pump in case the level in the underground tank goes below the suction level.

5.1 SYSTEM ARCHITECTURE:



6. ADVANTAGES:

- Reduces man-power
- Reliable system
- Low cost system

7. CONCLUSION:

The proposed work will help to eliminate the traditionally completely. This would lead to next generation` of human computer interaction in which no physical contact with the device is needed.

In this dynamic world motor is the most convenient and use- full tool in industry. Large rated motor required flexible control and protection. We hope our project can bring dynamic change in irrigation motor controlling system.

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