Automatic Irrigation System

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Abstract: The greenhouse based modern agriculture industries are the recent requirement in every part of agriculture in India. In this technology, the humidity and temperature of plants are precisely controlled. Due to the variable atmospheric circumstances these conditions sometimes may vary from place to place in large farmhouse, which makes very difficult to maintain the uniformity at all the places in the farmhouse manually. Drip irrigation is artificial method of supplying water to the roots of the plant. It is also called micro irrigation. In past few years there is a rapid growth in this system. The user communicates with the centralized unit through SMS.

I. INTRODUCTION

Now a day's farmers are struggling hard in the agricultural fields round the clock. They do their field work in the morning session and irrigate their land during night time with intermittent intervals. Farmers working in the farm lands are dependent on the rains and boar wells for the irrigation of land. Even if farm land has water pump, manual intervention by farmers is required to turn ON/OFF pump whenever needed. The task of irrigating fields is becoming quite difficult for the farmers due to lack of regularity in their work and negligence on their part because sometimes they switch on the motor and then forget to switch of which may lead to wastage of water. The proposed system, tried to minimize manual intervention by the farmer and helps the farmer to ON/OFF the motor and provide update status of the operation carried out in the agricultural fields via SMS with the help of GSM modem and monitor soil moisture, Temperature, water level and hence reduce chances to damage the motor because farmers are not familiar with the technical problems occurred in the motor.

II. SYSTEM ARCHITECTURE

The fig. shows the system architecture of Automatic Irrigation System. The centralized unit communicates with the system through SMS which will be received by the GSM with the help of the SIM card. The GSM sends this data to PIC 16F877A which is also continuously receives the data from sensors in some form of codes. After processing, this data is displayed on lcd

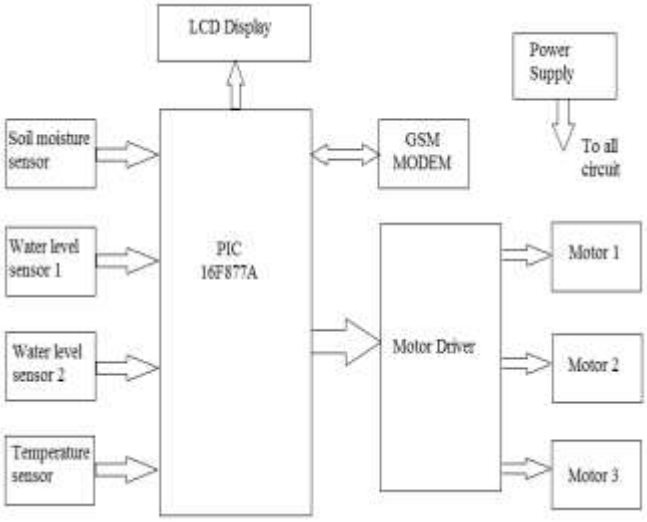

Fig1. Block Diagram Of Automatic Irrigation System

III. Soil Moisture Sensor

Fig.2 Soil moisture sensor

Soil moisture sensor Measuring soil moisture is very important in agriculture to help farmer for managing the irrigation system. This sensor measures the content of water. Soil moisture sensor use the capacitance to measure the water content of soil. It is easy to use this sensor. Simply insert this rugged sensor into the soil to be tested and the volumetric water content of the soil is reported in percent.

IV. Water Level Sensor

The LVR500 Series is a general-purpose continuous float level transmitter that provides a loop powered 4-20 mA output. The 4-20 mA output can be used to provide the proportional level of liquid in any tank or vessel. The signal can be connected to any device that accepts loop powered 4-20 mA signals, such as a PLC, SCADA, DCS, display, controller, etc.

The LVR500 Series is designed for vertical mounting in a tank. Reed switches are evenly spaced over the operation range to achieve the desired resolution. A single magnet-

containing float travels the length of the sensing range. The reed switches are magnetically actuated as the float moves with the liquid level. DC power is applied to the switch, and the output signal can then be routed to programmable controllers, microproc essors or other readout devices.

Fig3.water level sensor

V.Temperature sensor

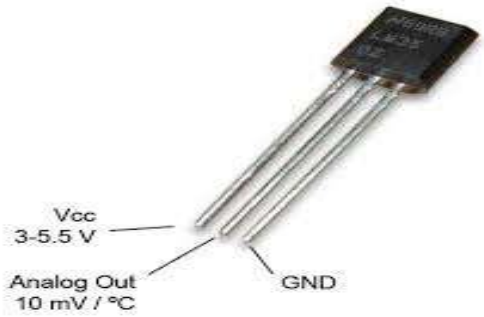

Fig.4 Temperature sensor

The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling. The LM35 device does not require any external calibration or trimming to provide typical accuracies of ±¼°C at room temperature and ±¾ °C over a full −55°C to 150°C temperature range. Lower cost is assured by trimming and calibration at the wafer level. The low-output impedance, linear output, and precise inherent calibration of the LM35 device makes interfacing to readout or control circuitry especially easy.

VI.GSM MODEM

The long form of GSM is Global System for Mobile communication. Most GSM uses frequency band of 900 MHz or 1800 MHz [6]. This GSM modem acts just like a mobile phone. The modem uses RS232 standard for communication. The modem can be connected to serial port of PC or to any controller. GSM modem is used to send and receive SMS or to make/receive voice calls. It can also be used as GPRS modem to use internet service. When PIC16f877 receives signal from sensors it sends AT commands to GSM modem to make a call to a predefined number stored in program.

III. FLOW CHART

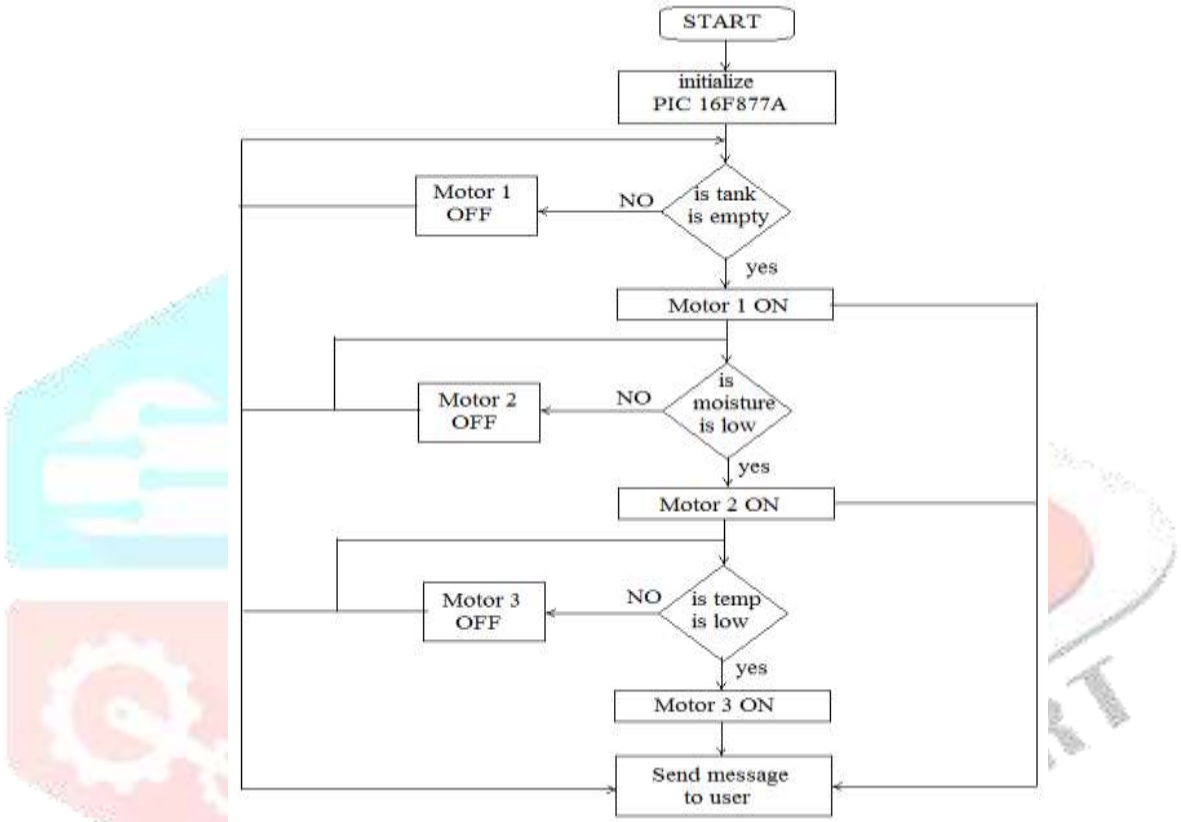

Fig. 5 Flowchart

IV. FUTURE SCOPE

The working of project basically dependent on the output of sensors. Whenever there is need of excess water in the desired fields then it will not be possible by using sensor technology. For this we will have to adopt the DTMF technology. By using this we will able to irrigate the desired field & in desired amount.

V. RESULT

Fig.6 Result when moisture level is low,motor 2 is ON

VI. ACKNOWLEDGMENT

Today on completion of this project report, the persons we need to thank the most who have helped us throughout the making of this report and without whose help it would not have seen the light of the day.

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Dipali S. Ahirekar, Kajal B. Adsul, Pragati A. Adsul.

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