

THREE PHASE MOTOR CONTROL USING GSM

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Abstract: This paper provides development of mobile phones as remote control application for the induction motor-pump which is used in the agriculture. Due to frequent power cuts and abnormal voltage conditions in India, it is necessary to distribute water efficiently to the fields during normal conditions. This is carried out by exchanging the information between the user phone and GSM in the form of messages. This system is developed with AT89C51 Microcontroller which is connected to the GSM and the motor. The microcontroller includes the protection against over-current, dry running and single phasing. It is expected that this application provides easy access of motor to a great extent.

Keywords: AT89C51 Microcontroller, GSM– Global System for Mobile communication, Mobile, SMS– Short Message Service.

I. 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. Irrigation is the science of planning and designing an efficient, low-cost, economic irrigation system tailored to fit natural conditions. By the construction of proper distribution system, the yield of crop may be increased because of controlled water supply.

II. METHODOLOGY

A. GSM BASED MOTOR CONTROL

The aim of this paper is to develop a cost effective solution that will provide remote control of induction motors through mobile phones using messages. The mobile user in the world has a tremendous rise during the past few years.

Remote monitoring of processes, machines, etc., is popular due to advances in technology and reduction in hardware cost. Cellular networks provide Short Messaging Service (SMS) approach offers simple interface with only destination cell phone address and message requirement without any header / protocol overhead.

B. SYSTEM DESCRIPTION

In this project we can switch On & Off 3-Phase motor pump through mobile by using GSM. For this purpose we will use 3 Phase supply, Micro-controller IC, LCD Display, Max 232, GSM Module, Current Amplifier, Relay & 3 Phase Pump.

Above Block Diagram shows if 3 Phase supply is Ok GSM will give message to mobile & mobile will display message “3Phase is Ok”.

If we send message “Pump On” to GSM Module through mobile, relay circuit will switch In the pump with the help of Current Amplifier. Pump is working on 3 Phase power supply so out of 3 phase if any phase is braked, pump will immediately off & GSM will inform status of 3 Phase supply to the mobile. Then mobile will display message “Pump Off”.

C. CELL PHONE BASED SYSTEM

The GSM modem communicates with the user cell phone to intimate the condition obtained for the microcontroller. Serial Port Adapter works in data and AT modes and needs to be properly configured.

During power-on condition, LCD is initially in data mode and by sending characters, the device is moved into AT mode for configuration. In AT mode, series of commands are sent for proper configuration. If match is found, it starts data communication between micro-controller system and GSM. AT commands are sent by sending text strings along with specified command strings through serial port to cell phone and are executed on receipt of carriage return.

SMS Approach: SMS is store and forward way of transmitting messages between cell phones. The major advantage of using SMS is provision of intimation to the sender when SMS is delivered at the destination and ability of SMSC to continue efforts for delivery of message for the specified validity period if network is presently busy.

The text message is sent to cell phone using CMGS command.

D. MICROCONTROLLER SYSTEM

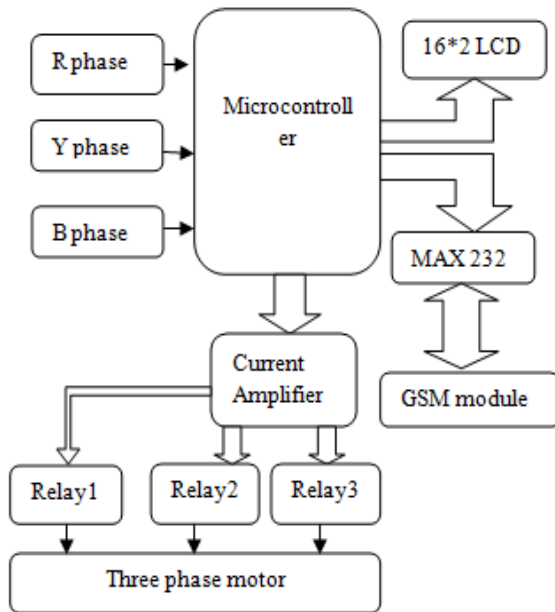


Fig.1 Block Diagram

The microcontroller provides the following standard features: 8K bytes of Flash, 256 bytes of RAM, 32 I/O lines, Watchdog timer, two data pointers, three 16-bit timer/counters, a six-vector two-level interrupt architecture, a full duplex serial port, on-chip oscillator, and clock circuitry.

The MAX232 which converts the 12V DC into 5V Dc and vice versa. The transmitter and Receiver of the Controller are connected to the 11th and 12 th pin of MAX232.

The block diagram of the system is shown in the Fig.1. The missed calls are received from the user mobile to perform specific task. Based on the received signals and sensor conditions, the signals are sent to the microcontroller to switch on/off the motor through the starter using the relays. The relay is controlled by the ports.

III. CONCLUSION

Thus the developed system enhances the water distribution in the field optimally. The system ensures protection of motor against overloads, overheating and phase imbalances.

It also provides automated restarting if normal conditions are re-established. Uniform distribution of water at regular intervals, reduction in labour cost, prevention of unwanted water spillage, minimization of occurrences of motor faults and intimation to user about the completion of task are the major advantage of this system.

The use of mobile phone has become more common among the farmers and hence used. The system proves to be great boon to farmers whose pump sets are located far away from their homes due to capability of remote control using cell phone and intimation about any abnormal conditions.

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