Operation and Protection of Induction Motor Using Gsm Technology

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ABSTRACT-This project is used to monitor and control the temperature and load current of the motor through mobile phone.Mobile modem is interfaced with microcontroller. From anywhere we can send SMS to control the motor and cooler fan connected in the microcontroller. Mobile modem sends this information to microcontroller. In microcontroller, we have already programmed so it receives the signal from GSM modem, corresponding information is displayed on the LCD display. The microcontroller monitors the parameters like temperature and current measurement sensor and display in LCD. If one of the sensor is abnormal, the microcontroller controls the motor or cooler fan based on set value given using keypad. At the same time user transmit the message to mobile modem interface with microcontroller to control the load. If the parameter value goes out of range, then the message is sent to the operator. One mobile modem is connected to the microcontroller that is having the hardware interface unit and the other one will be with the operator. The operator wants to control the load unit to send the message to the hardware unit, we have to enter the phone number and the message that has to be sent. This will indicate only if there is any deviation in the parameter value.
KEYWORDS: Current and Temperature Monitoring, Control, , GSM, MPlab, Pic microcontroller, Mobile modem, Motor protection.

I. INTRODUCTION

Our project aims at protecting and controlling the induction motor from such problems using GSM technology. Induction motors are widely used as industrial motors, lift motors and in pumps.

Many problems occur in theses motors such as overheating , single phasing.In microcontroller, we have already programmed so it receives the signal from GSM modem, corresponding information is displayed on the LCD display. The microcontroller monitors the parameters like temperature and current measurement sensor and display in LCD.

II.LITERATURE SURVEY

In previous, we were continuously monitoring the operation of induction motor using microcontroller. If any fault occurs in motor that will be send to the user through GSM. In this project at-mega microcontroller are using because it having a two serial port.

The ATmega l62 is a low-power CMOS 8-bit microcontroller based on the AVR enhanced RISC architecture. By exceeding powerful instructions in a single clock cycle, the ATmega l62 achieves through puts approaching 1 MIPS per MHz allowing the system designed to optimize power consumption versus processing speed.

GSM Modem with a simple to interface a serial interface. Use it to send a SMS, make and receive calls and do other GSM operations by controlling it through simple AT commands from microcontroller and computers. It uses the highly popular SIM300 module for all its operations. It comes with a standard RS232 interface which

can be used to easily interface the modem to microcontrollers and computers.

The modem consists of all the required external circuitry required to start experimenting with the SIM300 module like the power regulation, external antenna, SIM holder, etc.

III.OBJECTIVE OF THE PROJECT

- To provide continuous monitoring of the current and temperature and send message to mobile automatically.
- To control the operation of motor using microcontroller.
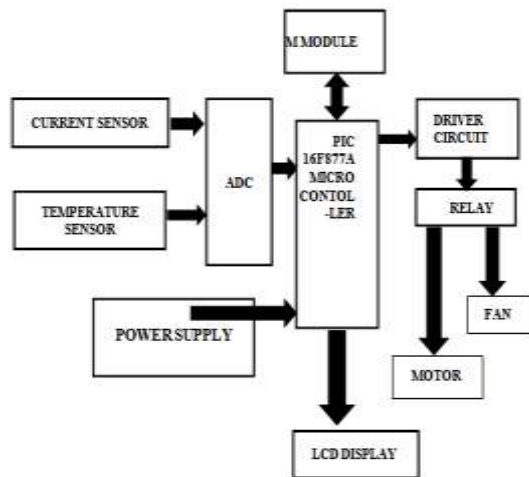- To improve safety.

IV.BLOCK DIAGRAM

Figure 1. Block diagram of the proposed system

V.WORKING

If the parameter value goes out of range, then the message is sent to the operator. One mobile modem is connected to the microcontroller that is having the hardware interface unit and the other one will be with the operator. The operator wants to control the load unit to send the message to the hardware unit, we have to do enter the phone number and the message that has to besent. This will indicate only if there is any deviation in the parameter value.

VI. IMPLEMENTATION
REMOTE MONITORING AND CONTROL:

Using GSM technology, the motor can be monitored and controlled remotely. A GSM modem can be connected to the motor control panel, which can send and receive SMS messages to control the motor's operation. This way, the motor can be turned on or off remotely, and its operating parameters can be monitored, such as temperature, speed, and load.

FAULT DETECTION AND REPORTING:

In case of any faults or abnormalities in the motor's operation, the GSM modem can be programmed to send an alert message to the concerned authority, indicating the nature of the fault and its location. This can help in quickly identifying and rectifying the fault, minimizing downtime and reducing the risk of damage to the motor.

ENERGY MANAGEMENT:

Using GSM technology, the motor's energy consumption can be monitored and controlled remotely. The GSM modem can be used to send energy consumption data to a central server, which can be used to analyze the motor's energy usage patterns and optimize its operation for maximum efficiency and minimum energy consumption.

PROTECTION AGAINST THEFT:

The GSM modem can be used to implement an anti-theft mechanism for the motor. In case the motor is moved or tampered with, an alert message can be sent to the concerned authority, who can take appropriate action.

To implement these functionalities, the motor control panel would need to be equipped with a GSM modem and appropriate software for controlling and monitoring the motor's operation. The software would need to be programmed to receive and process SMS messages from the GSM modem, and to implement the desired functionality based on the received commands. The software would also need to include algorithms for fault detection and energy management, and an anti-theft mechanism would need to be integrated into the motor control panel.

VII.SCOPE OF THE PROJECT

1.The implementation of GSM technology can be further integrated with other emerging technologies such as the Internet of Things (IoT), artificial intelligence (AI), and cloud computing to provide more advanced and sophisticated motor control and monitoring systems.

2.The anti-theft mechanism implemented using GSM technology can be further enhanced with advanced security features such as GPS tracking, motion sensors, and biometric authentication to provide more secure protection against theft.

3.The implementation of GSM technology can be scaled up to include multiple motors and control panels, providing a more comprehensive and centralized motor control and monitoring system.

So, the operation and protection of induction motor using GSM technology has a wide range of potential future applications, and as the technology continues to

evolve, we can expect to see even more advanced and sophisticated motor control and monitoring systems.

VIII.RESULT

It has been successfullyimplemented GSMtechnology, the motor can be controlled remotely, providing greater flexibility and convenience in operation. This can also lead to more precise control over the motor's speed, torque, and other operating parameters, resulting in improved performance and efficiency.

The implementation of GSM technology provides advanced protection mechanisms against faults and abnormalities in the motor's operation, reducing the risk of damage and downtime. This results in improved reliability and lifespan of the motor.

The GSM technology is used to monitor the motor's operation in real-time, collecting data on various parameters such as temperature, and current. This data can be analyzed to optimize the motor's operation for maximum efficiency and performance.

The relay is programmed to detect faults in the motor's operation and send alerts to the concerned authority in real-time. This helps in quickly identifying and rectifying the fault, reducing downtime and minimizing damage to the motor.

The result of operations and protection of induction motor using GSM technology can result in improved performance, reliability, and efficiency of the motor, leading to significant benefits in terms of cost savings, reduced downtime, and improved sustainability.
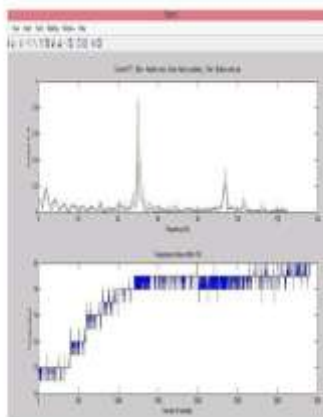
IX. SIMULATION

Fig 2. Fault current and temperature rise test results

X.CONCLUSION

In this dynamic world motor is the most convenient and useful tool in industry. Large rated motor requires flexible control and protection. We hope our project can bring dynamic change in our industrial level motor controlling system. We tried to implement our theoretical knowledge successfully. This course teaches us about the far difference between theoretical and practical knowledge. And also, as aimed, using this project we are able to protect the motor from severe effects of single phasing and overheating during abnormal conditions. So, in this project we were able to distinguish to the problem of single phasing problem in a accurate way. Our future improvement for this project is to expand the project for commercial use in industrial sides.

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