Condition Monitoring & Control of Induction Motors by using IoT Platform for Agriculture System

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Abstract— This proposed system represents Implementation of IOT (Internet Of Things) for monitoring and control of Induction Motor for applications as Agriculture field. The aim of this project is to design and implementation of IOT technology to monitor, to control and diagnose the condition of Induction motors by recording key operation indicators. The proposed method comprises of an IoT based platform to collect and process the induction motor parameters like temperature, speed, current, voltage etc. and parameter of soil moisture, humidity, temperature etc. The data collected can be stored in the cloud platform and same can be accessed through the web page. And also timely alerts will be received for any violation in desired limits of parameters under monitoring, So that immediate action can be taken to avoid unwanted downtime of the motor that saves time and money. Advantages of this method includes continuous monitoring of the equipment, receiving alerts, and data availability for predictive maintenance

Keywords—IoT-Internet of things

I. INTRODUCTION

Most of the Indian population depend upon farming and one third of capital income of India is from agricultural products. Certain issues related to farmers are always impeding the development of country. Development of smart agriculture methods can address some these issues. Most of the farmers use Induction Motors in the fields and due to frequent power cuts, the manual presence is required to turn on and off the Motor. If the farmer resides far away from the location of the motor, especially during night times it will be difficult for the farmer. The proposed system have come up with a IOT based monitoring and control system which can address this issue.

Various possible faults in Induction Motor are Electrical faults, Mechanical faults and Environmental related faults. To achieve reliable , flexible, fault less and efficient operation of the Induction Motor, continuous monitoring of the above factors is essential in any field of application. IOT is the network of physical devices which connects and enables exchange of data through these devices. The main purpose of IOT is to reduce intervention and provide computer based automation. The IOT system comprises of Sensors, actuators, GSM, Wifi etc. The analysed data is accessed or monitored from a remote place using a web application developed. Instant alerts can be received on web page, whenever there is a violation of prescribed limits of parameters

II. SYSTEM METHODOLOGY / IMPLEMENTATION SCHEME

System Overview:

The proposed system have come up with a IOT based monitoring and control system for agriculture field specially for corps like tomato ,

The objective of condition monitoring of induction motor & farming soil is achieved by continuously recording the considered parameters using various sensors. A moisture, temperature, humidity sensor interfaced with MSP430 micro controller, is placed in the soil to sense the moisture content, humidity of system and temperature level of soil (and indirectly environment). All the sensors are connected to micro controller board which is to be installed at the motor and farm site. The Micro controller is programmed in such a way that the motor turns ON/OFF with the help of a Relay, depending upon the value of the moisture content. The sensors will sense the parameters and are analyzed by the micro controller board according to the instruction coded. The data sensed by different sensors can be seen on the serial monitor. The collected data can be stored on the IoT platform using wi-fi module. Using serial communication between the micro controller and the node mcu board the data is initially transferred to Node mcu board which can be seen on the serial monitor. Then using wi-fi functionality the data available at node mcu is uploaded to Thingspeak cloud platform.
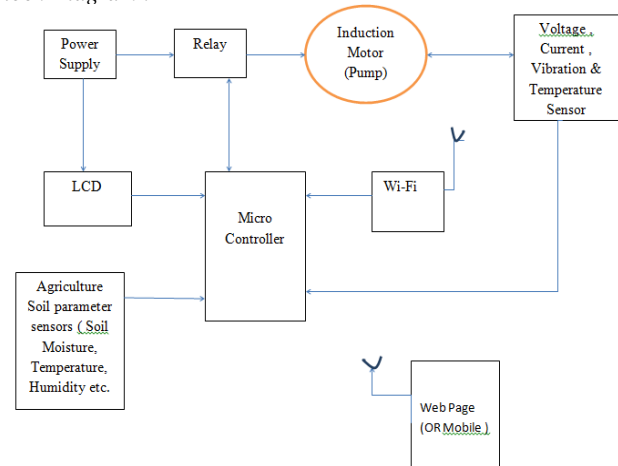
Block Diagram :

Fig : Block diagram of system for motor & soil parameter monitoring & control.

The objective of condition monitoring of induction motor & farming soil is achieved by continuously recording the considered parameters using various sensors. Accelerometer is used to record vibrations, LM 135 temperature sensors are used to record winding

and bearing temperatures, ACS712 current sensor for current, and a Voltage sensing circuit to measure voltage.

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IoT/cloud Platform: The central piece of the Internet of things architecture is IoT platform which enables the connection between the real and virtual worlds hence providing communication between objects. The IoT platform used in this project is Thingspeak which is an analytic platform service that allows to visualize and analyze live data available in the cloud and is operated by Math works. It produces visualizations for the data uploaded by the devices to the platform instantly.
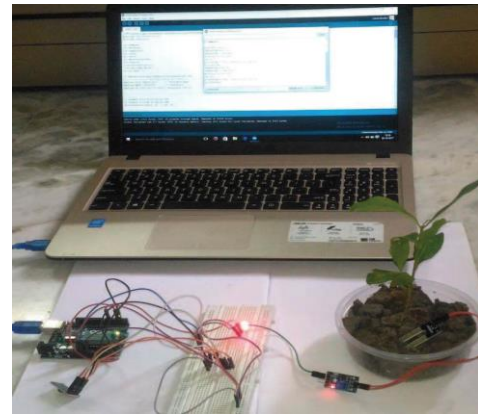

Fig : Experimental set up

III . CONCLUSION

This proposed work " Real time Condition Monitoring & control of Induction Motors by using IoT platform for Agriculture system" has been implemented for on off control, condition monitoring of Induction Motor in focussed agricultural field mostly in farming of tomato, pomegranate, drumstick tree. With the help of IOT real time measurement of different motor & soil parameters it is possible which avoids the conventional prediction control. With early detection of faults in the motor, process interruptions, damage to the motor can be reduced to a greater extent which inturn makes the farming more reliable affiliations

IV. ACKNOWLEDGMENT

Flowchart :

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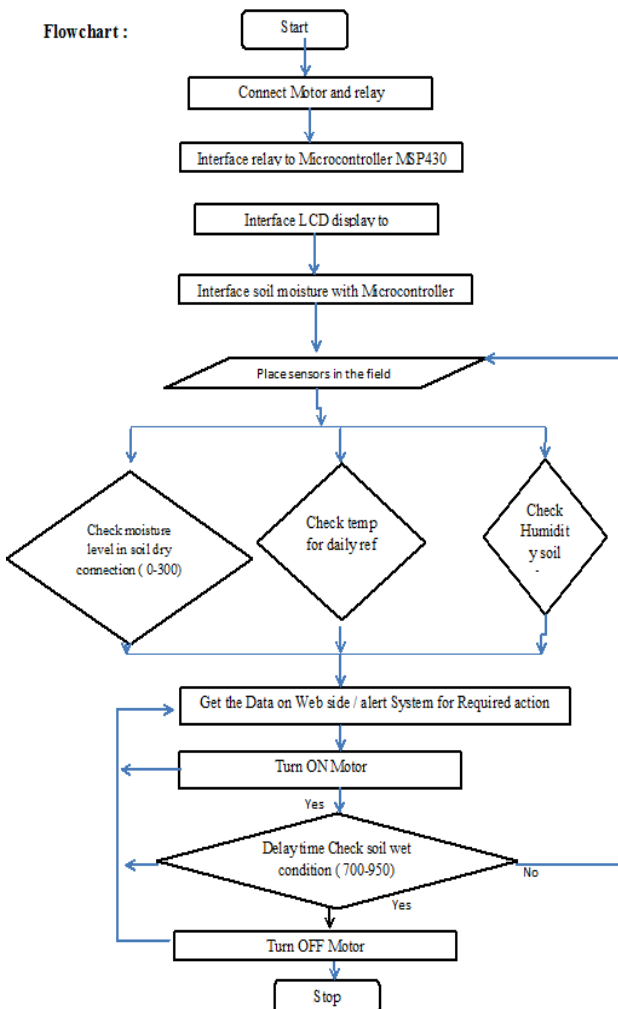
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