

IoT Based DC Motor Protection, Control and Monitoring

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Abstract - DC motor plays very important role in different industries. In this review paper, we are discussing about a system which provides protection to the DC motor as well as helps in control and monitor various parameters. We have used Node MCU 8266 wi-fi and web server also with the help of some transducers we can easily achieve our goal to protect and control the motor as well as to monitor various parameters. We have provided various controls through internet to avoid faults in DC motor.

Index Terms- DC motor, IoT, Node MCU wi-fi, Sensors, etc.

1. INTRODUCTION

DC motors are very useful for various applications because of their wide range of speed control and relatively small size. In previous time for controlling or operating two or more motors the workers need to go to respective location where the motor is placed but with the help of this technology the operator can easily control all motors of the plant from a single control room[1]. Also for checking various parameters of motor like current and voltage we have to use measuring instrument but with the help of this project we can continuously monitor the parameters on a single computer screen [2]. Various faults like short circuit fault are very common in DC motors to avoid these fault our system provide protection to DC motor.

In this review paper, we are working on a system which will provide protection of DC motor under faulty condition. Also we can monitor various conditions of motor by using this system. By this project we can reduce human efforts required for continuously checking the various parameters of motor for an interval of time.

Nowadays, IoT based embedded systems are used in various fields like technology, space, defense, research etc. So we have decided to use this system for protection, control and monitoring of DC motors. In various industries more than two DC motors are used for various applications so maintenance of those motors were a difficult task for the operators in the industry. But by the use of IoT based system any operator can check any motor's present status from the control room. He can record real time readings of various parameters like voltage, current and temperature by using IoT based system on a single computer screen. Also if he find any abnormal condition in any motor of the plant he can stop the motor from the control room by the use of IoT based system.

Voltage Sensor Module is used measure the input voltage to motor and the data of this voltage sensor module is then transferred to computer or mobile screen in the control room by using IoT system. ACS712 Current Sensor Module and Temperature Sensor are used for the same operation as they measure current and temperature respectively.

2. METHODOLOGY

The main methodology of this entire project is depends on IoT based embedded system so interfacing of all hardware with wi-fi and internet is very important part in its functioning. The whole programming is done in IDE and then it is load in the Node MCU and with the help of wi-fi and various sensors we have achieved the required goals like providing protection to motor from the abnormal or faulty conditions. Also study and observing of various parameters of motor like temperature, current and voltage. Controlling of motor is another very important factor in this project. Total functioning of project in terms of block diagram is shown in the Fig 1.

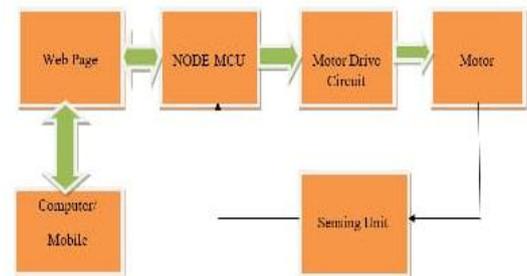


Fig 1 – Block Diagram

3. HARDWARE

This system is embedded system so hardware is very crucial part of this system. The most important hardware is Node MCU 8266 wi-fi. Through the Node MCU 8266 wi-fi all other hardwares are interfaced with the IoT system. We have used Voltage Sensor Module to measure voltage and its related abnormal conditions like over voltage or under voltage. For the same purpose we have used ACS712 Current Sensor and Temperature Sensor. Motor driving relay is also an important part of the system as it interfaces motor with the Node MCU 8266 wi-fi.

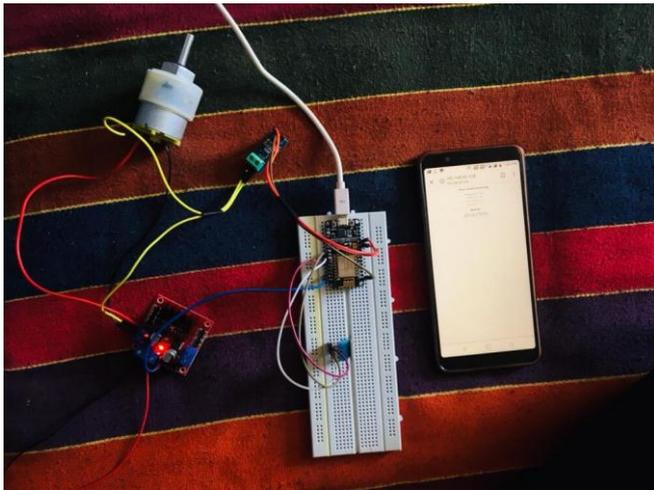
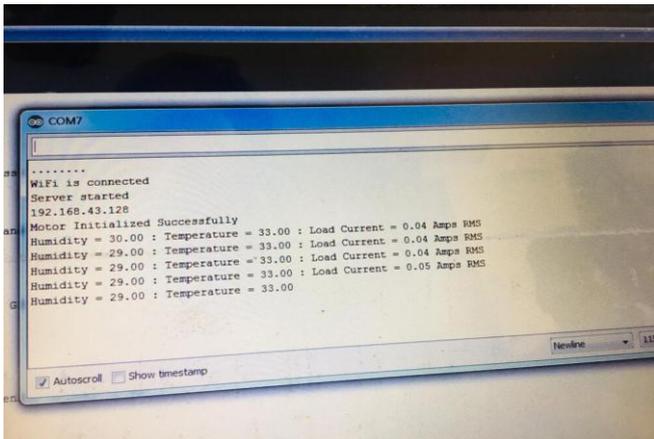


Fig 2 – Testing of Hardware

4. RESULT

In this project we have achieved results regarding humidity, temperature, load current etc as shown in Fig 2. The parameters are shown on the display to monitor, to control and to protect the motor. In harsh condition the motor will automatically gets off.



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