Speed Control of DC Motor by using IoT

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Abstract - *DC motor plays very important role in different industry application. This paper deals with a system which provides protection to the DC motor as well as helps in controlling and monitoring a various parameters. This project makes used of Atmega328, 8266 Wi-Fi modules and DC motor. The main zest of this paper is to controlled the speed of DC motor using IOT (Internet of Things).*

Key Words: *DC motor, IoT, ATMEGA 328, Wi-fi modules, Sensors.*

1. INTRODUCTION

Before you begin to format your paper, first write and save the content as a separate text file. Keep your text and graphic files separate until after the text has been formatted and styled. Do not use hard tabs, and limit use of hard returns to only one return at the end of a paragraph. Do not add any kind of pagination anywhere in the paper. Do not number text heads-the template w DC motor were the first form of motor widely used for industrial application. Small DC motors are also used in tools, toys and appliances. This motors is a class of rotary electrical machines that converts electrical energy into mechanical energy. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic to change the direction of current flow. DC motors are classified on the basis of their excitation configuration as follows.

1) Separately Excited DC motor

2) Self Excited DC motor

a) Series DC motor

b) Shunt wound DC motor

c) Compound wound DC motor

The basic working principle of DC motor is "Whenever a current carrying conductor is placed in a magnetic field, it experiences a mechanical force". The direction of this force is given by Fleming Left Hand Rule. The overall system based on IOT which is interrelated computing devices and ability to transfer data over a network without requiring human to human or human to computer interaction . The IOT evolved due to the convergence of multiple, machine learning and commodity sensors. In the consumer market, IOT technology is the most synonymous with products pertaining to the concept of the "Smart home" covering devices and appliances. IOT devices are part of the concept of home automation which can include lightening and air conditioning. This IOT based devices can be used to enable remote health monitoring and emergency notification system. The IOT can assist in the integration of communication, control and information processing across various transportation systems. Industrial IOT devices analyze data from connected equipment, operational technology, location and people. The IOT used for various manufacturing devices. It enable rapid manufacturing of new products and dynamic response to product demands. The IOT application in farming such as collecting data on temperature, rainfall, humidity, wind speed and soil content. This data can be used to automate farming technique and take informed to improve quality and quantity.

The IOT major significant trend in recent years is the growth of devices connected and controlled by the internet. The IOT creates opportunities for more direct integration of the physical world into computer-based system, resulting in efficiency improvements, economic benefits and reduced human exertion. The number of IOT devices increased from 31 % over year to 8.4 billion in the year 2017 and it is estimated that there will be 30 billion devices by 2020. The global market value of IOT projected to reach $ 7.1 trillion.

2. METHODOLOGY

The main methodology of this entire project depends on IoT based embedded system so interfacing of hardware's with wi-fi and internet is very important part in its functioning. The whole programming is done in arduino IDE and then load in the ATMEGA 328 microcontroller and with the help of wi-fi and various sensors. The required results will be done like providing protection to motor from the abnormal or faulty conditions. Observation of various parameters of motor like temperature, current and voltage will be achieved and also controlled direction of motion of motor with the help of relay and heat developed in motor which is sense by temperature senor. Total functioning of project in terms of block diagram is shown in the Fig 1.
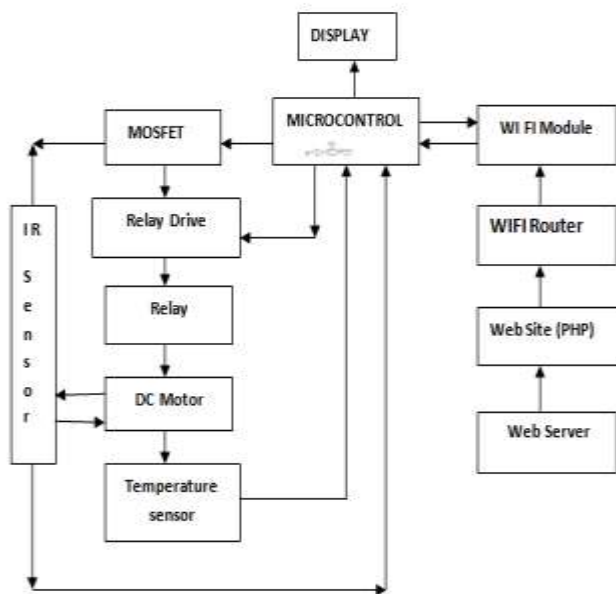
Fig -1: Block Diagram

3. COMPENTS USED

Mosfet: The Metal Oxide field effect transistor used to control the speed of DC motor through PWM.

Wi-Fi Modules (8266): Wi-fi modules used as IOT device, which is connected to the website. The command coming from the website will send the signals to processor through wi-fi modules.

Atmega 328: It is the heart of the system based on the processor ATMEGA 328. The Arduino IDE (Integrated Development Environment) will be used to program the speed control of DC MOTOR as well as wi-fi modules.

Temperature Sensor: A temperature sensor is a device that provides for temperature measurement through an electrical signal.

IR Sensor: An Infrared sensor is the actual sensor, it used to cut off the IR signal between transmitter and IR receiver.

Relay: The processor give the signal to the relay to change the direction of the motor.

LCD (Liquid Crystal Display): LCD connected to the processor it used to display the temperature of the motor as well as speed of the DC motor at rated value.

4. CONCLUSION

This paper, introduced a system that can protect, control and monitor the speed of DC motor remotely with the help of Wi-fi modules and IOT based system. Protection against the over current and thermal overloading is done by current and temperature sensor.

5. FUTURE SCOPE

Voltage range of motor used in this project is upto 44v, further research can be done for large rating of motor. One of the limitation in this project is that internet is required for its operation.

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