REVIEW OF INDUCTION MOTOR PROTECTION SYSTEM

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Abstract IoT is a lately presto-growing technology. Now a day's IoT plays a significant part in our day-to-day life. IoT becomes an important part of mortal life. Within the unborn several effects should be connected to the net. IoT comes altogether over fields like assiduity, home robotization, electric vehicle, traction, husbandry, medical field, etc. This paper deals with nonstop monitoring parameters of induction motor and speed control of Induction Motor. Therein covering parameters are voltage, current, speed, and temperature. Induction Motor monitoring parameters help within the conservation of motor before the circumstance of any variety of faults and avoid the interruptions of detention in the product. i.e., Trust ability of motor will be maintained by nonstop monitoring Induction Motor. If any fault occurs in the motor should be automatically dissociated from the vacuity by using IoT. Also, in numerous operations, variable speed operation is needed hence control the speed of Induction Motor as per our demand.

Keywords **— Induction Motor, Internet of Thing, Arduino Uno, sensors, cloud, speed control c technology.**

➢ INTRODUCTION:

Now day Induction Motor is the most demanded machine in all the fields. The required characteristics of an induction motor are a simple operation, good power factor, lower conservation, swish, reliability, and cheaper

than other any kind of motor. Also, the Induction motor has good speed regulation, sustainable cargo capacity, and a high starting choker due to these advantages Induction Motor is most apply employed in each- operations like artificial motors, electric Vehicles, husbandry motors, etc. In Induction Motor there are so multitudinous forms of fault that do generally it's subdivided into three corridors areas

1. Electrical faults therein, there's one phasing fault, surplus voltage, cargo fault, Earth faulted.
2. Mechanical Faults in this basic stator and rotor winding defect, bearing fault, Rotor bar is brokenness.
3. Environment Faults in this, there's the vibration of the motor, Induction Motor girding terrain affects the performance of an Induction Motor like moisture, temperature, etc.

This paper represents IoT predicated Induction Motor monitoring parameters and faves controlling the operation of an Induction Motor with the help of the PWM fashion. Monitoring parameters of an Induction Motor are voltage, current, speed, and temperature. Covering the parameters maintains the continuity of the product in industriousness i.e., the product is going to be increased also helps any abnormality within the motor and descry an early fault within the motor. If there's any fault that takes place within the motor that should be detected by sensor sense and provides substantiation to Arduino UNO also from pall gives the command to the motor should automatically be separated from the system. And offers an alert communication in mobile for further detailing purposes that fault was done or for future work that should not be repeated.

➢ THE SPECIFIC FUNCTIONS OF THIS RESEARCH:

1. For safe and economic electronic communication in industrial and other fields, Monitoring and controlling the operation of an induction motor depend on the Internet of Things (IoT) is to do.
2. By Early fault detection, process interruption of the motor is reduced, also reducing damages to the motor in a process to a much bigger extent which makes the motor should be more reliable.
3. To protect Motor from overloading, over-current, and warmth.
4. To avoid system failures by starting and stopping the operation of an Induction Motor by Automatic or manual control methods. 5. The widely used method for detecting faults within the motor is often Analysis within the Graphical form of current and voltage waveform.

➢ LITERATURE REVIEW:

William H. Kersting [1] stated that a three-phase induction motor can still run when one phase of the availability goes out of service. This might flow from any fuse blowing or opening of the protective device of the motor, a transformer, or at the feeder end. At this condition, the three-phase induction motor still runs, but the motor will heat up quickly, and it should be protected by being removed from the service at the moment of single phasing When the phase opens at the step-down transformer or the feeder end, the stator and rotor

losses increases to 10 times and also the shaft output power decreases to negligible. But if the one phasing occurs in the motor terminal the bosses increase twice as compared to steady-state losses and therefore the shaft power reduces to almost 70%. To guard the motor all the terminals should be open.

Sutherland P. E and Short T.A. [2] described that for single pulse fiat the three pulse reclosers are widely employed on distribution feeders. The bulk faults are single phases. Its negative effect occurs on the opposite two-phase customers because the distribution line is especially supplying the bad to single-phase customers. If three-phase recovers didn't open from the service, and also the problem arises for 3 phase industry. On a mean single-phase Exit occurs at 70%, a two-phase fault occurs at 20% and a three-phase fault occurrence is 10%.

Sudha M. and Anbalagan [3] planned the way numerous to avoid wasting} lots of the three-phase induction motor from single phasing. throughout this system, the PIC16F877 microcontroller has been familiar with sampling the values of each part and changing them to low voltage inflicting transformers. The signals area unit is reborn to a digital worth victimization associate ADC device. The controller unceasingly compares the digital worth with the reference worth and once the fault happens, it opens the commonly closed contactor and disconnects it from the flexibility provided. Single phasing, under-voltage, and overvoltage protection area unit completed much on a 2kW motor, and additionally, the motor is isolated if any of these conditions occur.

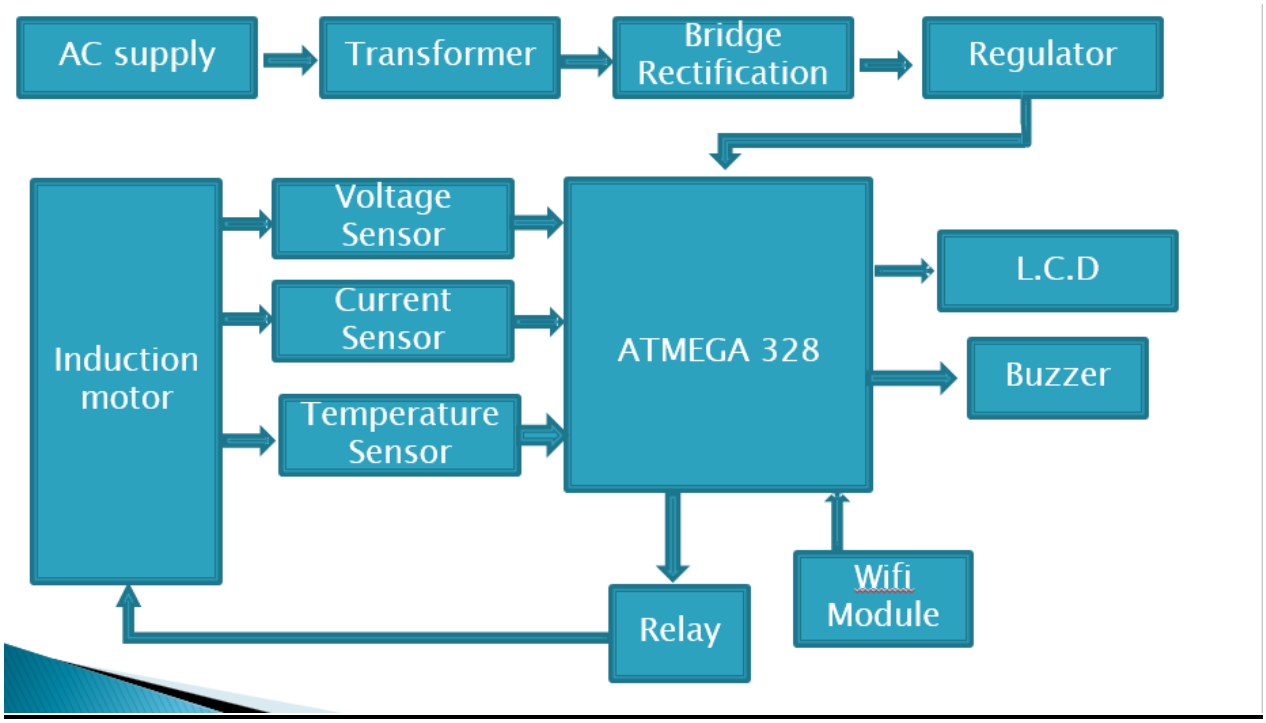
Pragasen Pillay et al. [4] examine the three-phase induction motor underneath the influence of voltage and overvoltage. The voltage at motor terminals is additionally on the far side of the worth during a} very advanced industrial system and may well be BEW from the value in a very heavily primarily based industrial system. IEEE, NEMA, and different power communities have completely different definitions the voltage unbalance. advanced pure mathematics is avoided in these definitions. throughout this paper calculation of the, unbalance of voltage is completed on truth basis of advanced pure mathematics and compared with NEMA standards.

Faiz J. et.al. [5] have studied the negative impact of the unbalanced voltages on the performance of a three-phase induction motor. during this paper, the comparison of the voltage unbalance definitions of NEMA, IEEE, and IEC (International Electrotechnical Commission) has been done. The studies showed that the definition is given by the NEMA, and IEEE square measures are easy to calculate as compared to IEC. However, all the 3 provide solely a plan concerning the share unbalance and want to be changed.

Javed A. and Izhar T. [6] have planned the protection of a three-phase induction motor supported voltage mensuration isn't enough to safeguard the motor if a fault happens at the distribution electrical device or station

feeder. If a fault happens at motor terminals, then the voltage mensuration will defend the motor o.k. this mensuration device ought to be enforced inside the protecting device. they need to plan a section mensuration device which will live the section distinction of the voltages as a result of once the fault happens at the other location instead of the motor terminals, then the faulted section can draw a negative sequence current and work as a voltage generator. The voltage developed is on the point of line voltage however the mensuration theme isn't ready to sight the fault, but the phasor distinction of the faulted section changes.

- **BLOCK DIAGRAM OF THE SYSTEM:**

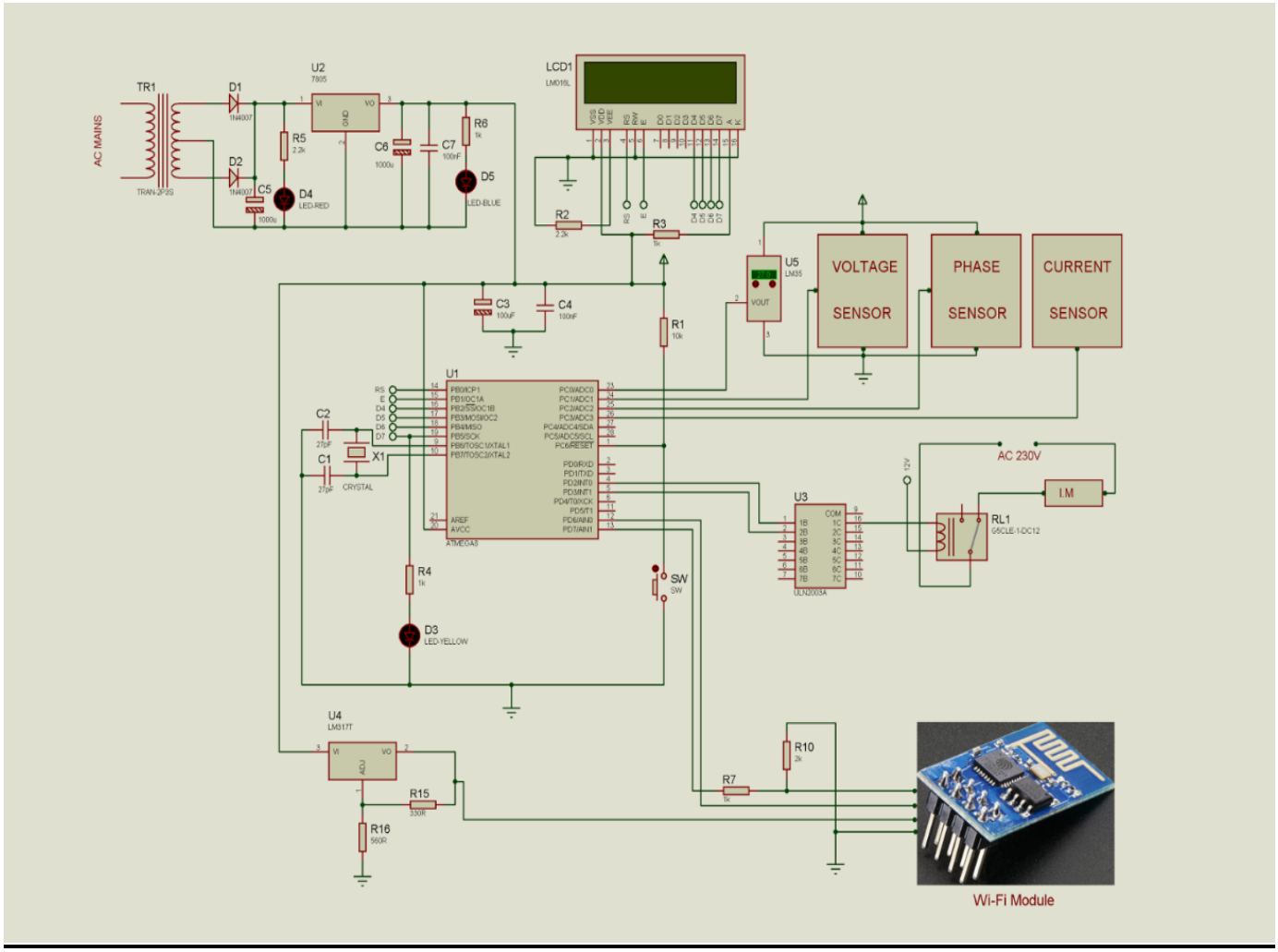


Block diagram of the induction motor protection system.

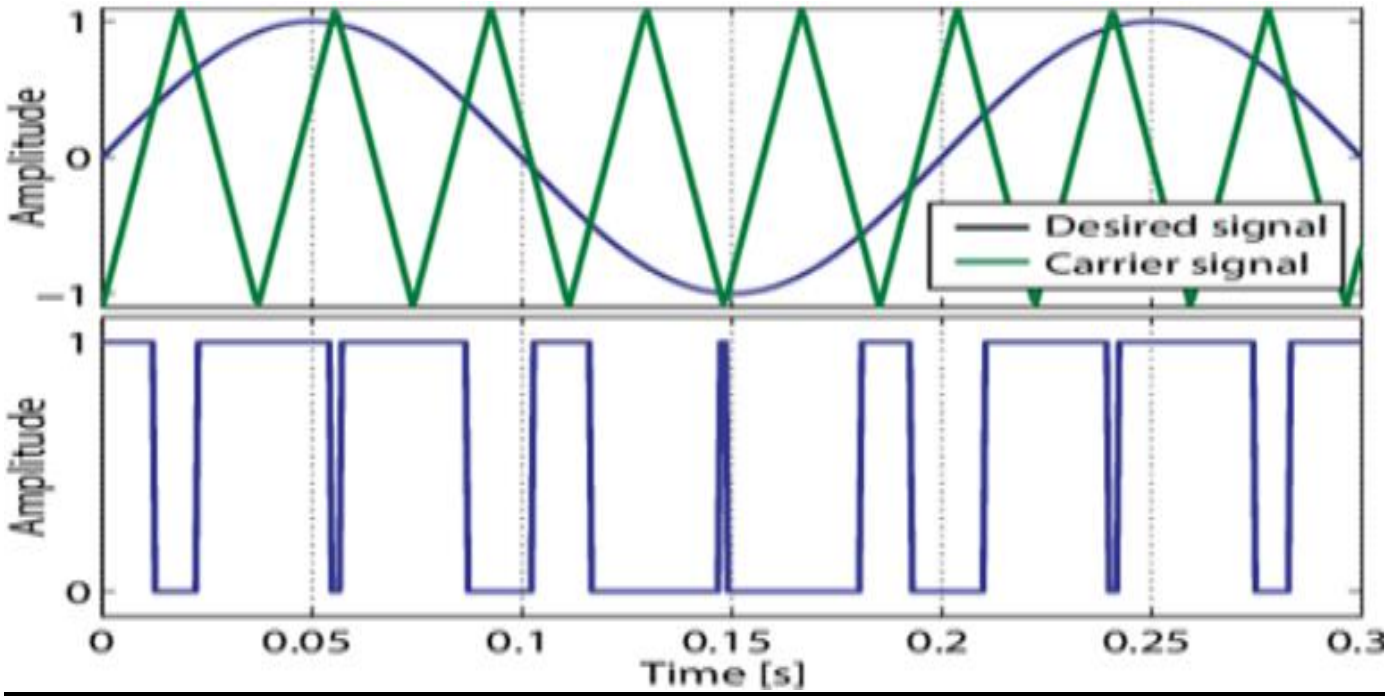
In this diagram, there are four sensors used for sense parameter are voltage, current, speed, and temperature sensors with the help of this monitor the condition of the motor and provides the current status of a motor to the Arduino, from Arduino with Wi-Fi the module gives to the cloud to store the knowledge and from cloud, it'll receive within the message form to the mobile application. If there's any fault takes place Induction Motor should automatically disconnect from the availability. Whatever parameter is monitored it'll display one by one in a website application the same it'll be displayed on an LCD that's connected to Arduino.

➢ PLAN OF THE SYSTEM:

The below diagram is the overall diagram of the system. This diagram provides you with elaborated info concerning the system. This diagram clarifies the particular operating of the system. Here the particular operating of the system is that the first single-phase offer comes into the system that offers to single section Induction Motor through speed dominant device AND gate driver circuit i.e., it acts as a logic circuit to on-off the switches that use within the speed dominant devices. There is a unit such a big number of ways used to dominate the speed of the motor. This paper represents a PWM technique for speed management of the motor. The PWM methodology is the simplest and most typically used methodology for dominant the speed of the motor. by adjusting the ON-OFF amount of Triac switches dominant the firing angle from the firing angle speed of the motor will management simply.



Overall block diagram induction motor protection system.



➢ CONCLUSION:

This paper represents the IoT-based induction motor protection system with the help of sensors and Wi-Fi modules. Also, control the speed of an induction motor with the help of the PWM technique. The protection system and safe operation of an induction motor can be obtained on a large scale. Also Due to its use of it, comfort and inaccurate control of the induction motor can be achieved.

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