

# Intelligent Tracker cum Protector for Industrial Motor

Pooja Patil, Vaishnavee Vyas, Komal Vernekar,

Ms.P.P.Shide

Department of electronics and tele communication,

[chockypatil7850@gmail.com](mailto:chockypatil7850@gmail.com)

**Abstract**— Three phase induction motors are the motors most frequently encountered in industry. They are simple, rugged, low price, and is to maintain. Most of electrical energy is utilized by induction motor and thus it is essential to monitor the performance of motor without changing its operation.

Here in this paper, introduces a new technique in which embedded system is integrated into the serial communication network .during this technique different sensors are connected with motor and the values are extracted using PIC microcontroller. It is also possible to protect the motor against some faults such as over current, over voltage, over temperature in windings, over loading of motor. Therefore, controlling, monitoring and protection of the system are realized in real time.

**Keywords**— Three phase induction motor, computer,PIC 16F877A,16X2 LCD display,MAX 232 , LM35, voltage transformer , current transformer,realy.

**Introduction**-3 phase induction motors are very popular in industrial applicaton because of their simple and safe structure. Therefore several controlling methods have been suggested to obtain a better controlling system for them in recent year traditional control system have been given up, and intelligent control system have been used instead. In 20<sup>th</sup> century development in electronics and computer technology has started new processing control technology and automation.

Controlling of electrical motors used in various systems and process control specially induction motor became very important. Performance of induction motor is directly affected by whole fundamental quantities. On the other hand controlling the machines during the process of production continues to be dangerous operation in some branches of industry.

Large number of motors are being used for general purposes in our surrounding from house hold equipment to machine tool in industrial facilities. The electrically related faults such as over voltage, over current, over temperature. The sources of over voltage and over current can be man-made or natural.

Possible causes for over current include short circuits, excessive load and incorrect design . monitoring of a induction motor is a fast emerging technique for the detection of initial faults. It avoids unexpected failure of an industrial process. In spite of there robustness they do occasionally fail and there resulting unplanned down time can prove very costly. Therefore , condition monitoring of electrical machines has received considerable attention in recent years.

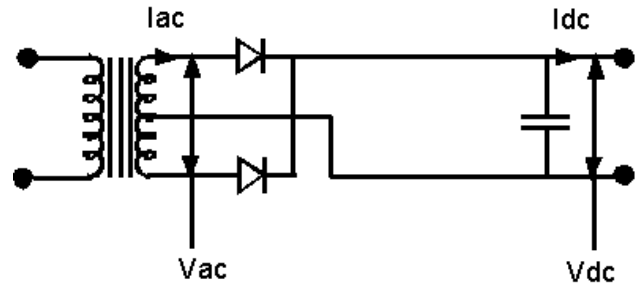
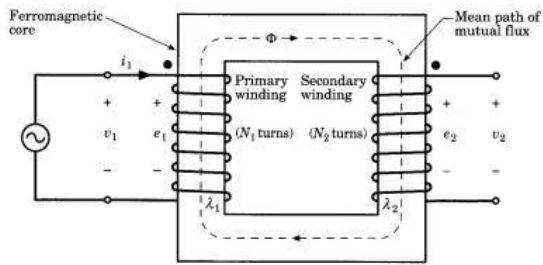
The control of the parameters such as voltage ,current and temperature is also become very important for the help of induction motor. To the faults in such parameter their can be damage to the motor. A computer based protection sytem has been introduced , measurements of the various faults f phase voltage, phase current, phase temperature were achieved and transfer to computer for final protection decision.

## Remaining contents-

### 1]Over current :-

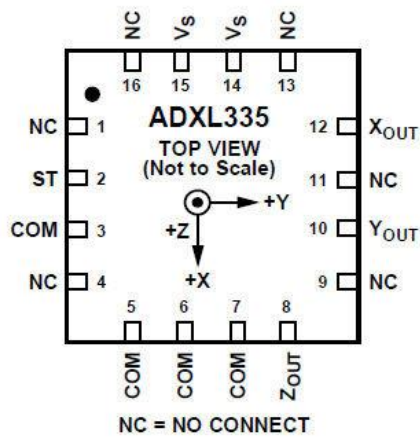
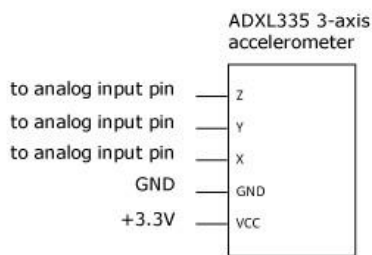
- Current transformer are used as a current sensor .



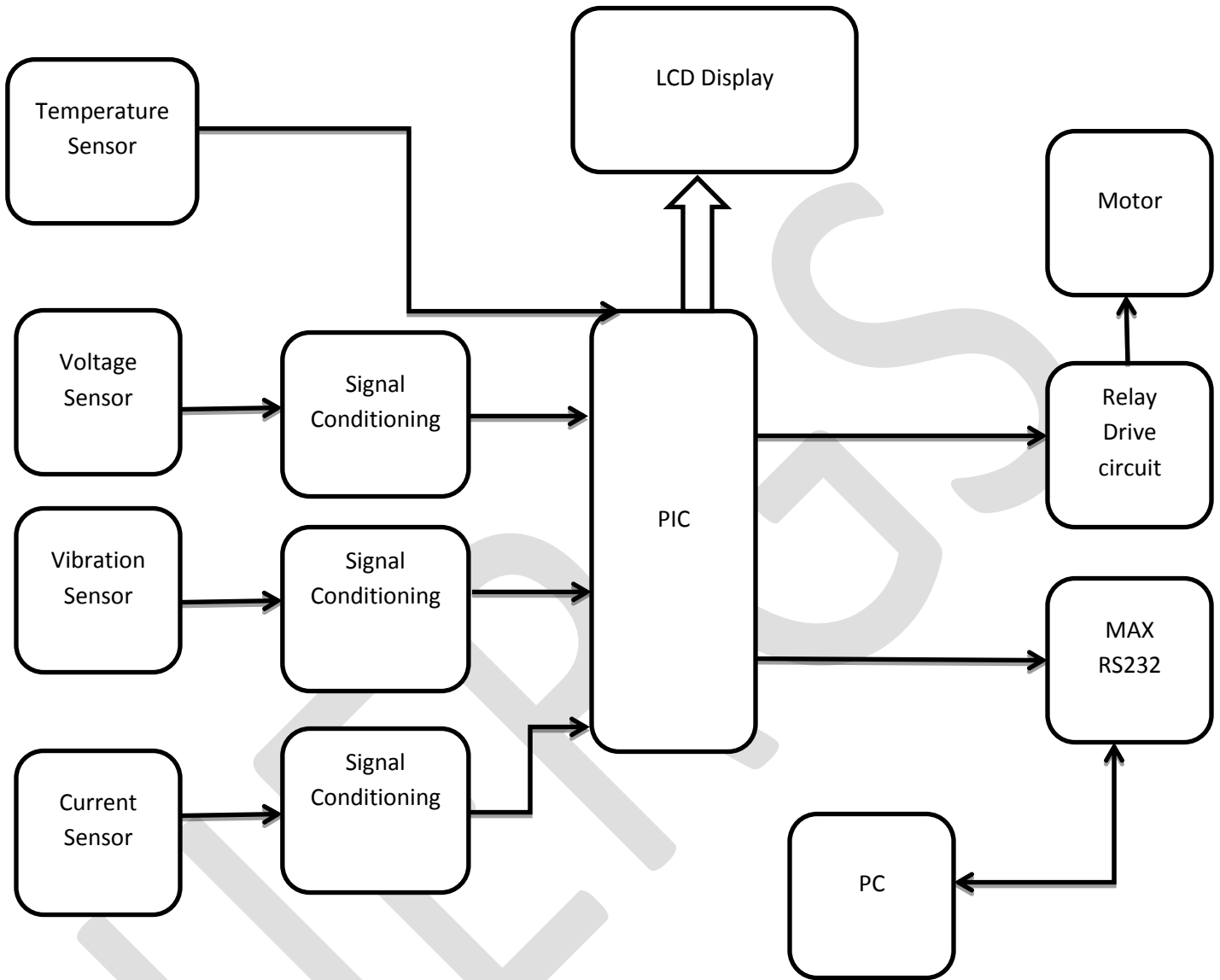


#### 4]Vibration sensor:

- Accelerometer is used as a vibration sensor.
- Input is 3.3 to 5v DC.
- PIC channel number 7 and PIC pin no. 10 is used.
- Accelerometer is connected in X-Axis.



**BLOCK DIGRAM:**



- This project is divided into two parts. First part is server side and second part is actually motor side.
- The motor side part comprises central processing controller is PIC16F877A to which required power supply that is 5v on board is generated again 16\*2display is interfaced to the PIC controller.
- Other components like crystal and reset circuitry is also on the board. To this controller various sensors including voltages of all three lines that is voltage sensor again current of all three lines that is current transformer and temperature of the motor and also vibration sensors are attached all the data of voltages, current, temperature and vibration is received and display on the site.
- At the same time after certain intervals the data is sent to server. MAX232 interface is established between controller and server net.
- In server side visual basic software is used to create a graphical user interface simultaneously the received data is stored in data base for the same Microsoft access is used. Thus all the parameters of the motor are received simultaneously and stored again in a controller side in order to secure the motor from various hazardous situations set points are created that is for current if particular current exceeds the set point value then automatically motor gets off again for any failure of phase or less voltage than set voltage if the voltage comes down automatically motor gets off.
- Again operating temperature is set up to 45degree Celsius if motor temperature crosses 45degree automatically motor gets off. Again the vibration sensor indicates that for any misalignment due to failure of bearings etc. which causes vibrations if vibration level is reached to certain limit automatically it indicates that preaintenance is required. Thus entire system helps in monitoring all the parameters and controlling actions are taken.

**Acknowledgment-** This project e was supported by Nav Maharashtra Textile industry . We thank our colleagues from sanjay ghodawat institute who provided insight and expertise that greatly assisted the project , although they may not agree with all of the interpretation of this paper . We thank Ms. P.P.Shinde for assistance. And Dr. S.R. Chougale for comments that greatly improve the manuscript.

**CONCLUSION-** In this project we are dealing with different problems of IM such as over current, over voltage, over temperature, vibration monitoring during it's time of operation and gives indication to PC through serial communication. Suppose during operation if load increases on motor then relay stop the motor. And gives continues readings of all parameters. In this way we can overcome the problem of product failure. And saves the time of workers.

#### **REFERENCES:**

[1]International Journal of Digital Application & Contemporary research, January 2014.

[2]International Journal of Engineering Research and General Science Volume 3, Issue 2, March-April, 2015

[3]Journal of Automation and Control Engineering Vol. 4, No. 3, June 2016