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IOT Based Single phase Induction Motor Protection System

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Abstract: ***The main aim of the paper is to process the time data acquisition under the supervisory physical parameter of a power induction motor. In industries the heavy capacity induction motors are used. Therefore, it has essential to observe all the processes and control the factors affecting them. Adapting a technology like an internet of things one can do the objective effectively, and thus record and the control is obvious than the manpower or existing one.***
Keywords: Induction motor, Protection system, IOT, Voltage, Current

I. INTRODUCTION

The main objective is to extend the reliability of the motor application by using the recent technology advancement. This work makes sure the continuous monitoring of induction motor. By ensuring the system reliability abnormality are easily identified and simply rectified. As induction machine are used nearly 90% in industries, the economic data monitoring is required. The productivity of industries may be increased by doing the preventive maintenance of induction machine. By taking fortification the failure of system and value of mental attitude power motor is protected. The main goal of the server is to provide fast and relevant information about the real word objective and application.

II. LITERATURE REVIEW

Induction motor are utilized in several industrial applications during an awfully wide variety of operational areas due to their easy and powerful structure, and low production prices providing a protection system is extremely necessary in industries. The key role played altogether set of module is buttressed by IOT and as far as concerned to the cumulative development and growth in field of IOT is yet to come back and would functions the zeitgeist of the present and well as generation to return. As per existing scenario prescience may be drawn that portraits that in era to come back most of the thing would be preoccupied by Internet and would act as an actuation for the humanity delivering the desired need at limit comfortably and affordability. The first function performed is, the information (temperature, light intensity) collected by the Control unit to centrally located server with the assistance of the USB communication as a medium of communication. That data which is transmitted is displayed on PC and may be stored for future reference.

III.SYSTEM DESIGN

In this circuit for microcontroller and sensor a 5V DC, and 12V transformer is used to step down 230V to 12V and rectified with (1N4007 diode) centred tap rectifier with capacitor filter of 1000uf; output is DC 12V-14V in step with transformer ratings. The battery output is given to the Arduino board, which is required to convert in 5V regulated for microcontroller and other devices, here we've got used LM7805 regulator for getting 5V regulated DC. For motor driver it's separately accustomed cancel loading effect. In this Arduino board (atmega328 28 pin microcontroller) works with 16MHz frequency used for (timer configuration), the unwanted frequency produced is bypassed by the capacitor of 27pf capacitor. 6 channels 10 bit inbuilt ADC available, 6 PWM pins available, multiple serial communication available, up to twenty programmable pins available.Atmega328 microcontroller pins 14, 15, 16, 17, 18, 19 are connected to LCD respectively. LCD shows text as our programming conditions. Like dam level is 25% etc. Microcontroller input temperature sensor is connected with A0, voltage sensor to A1 phase sensor to A2 and current sensor to A3 (current transformer), Wi-Fi modem is connected to pins of microcontroller to TX and Rx pins. It requires 3.3V supply given LM317 variable transformer, with 330 ohms and 560 ohm resistors. All capacitors of 0.1uf near analog / digital/ microcontroller are connected to chop back spikes within the circuit, spikes produced by inductive load / sparking contacts of loads and capacitor of 1000uf/25V at regulator output is connected for the cancel loading effect within the circuit while driving the high current source.

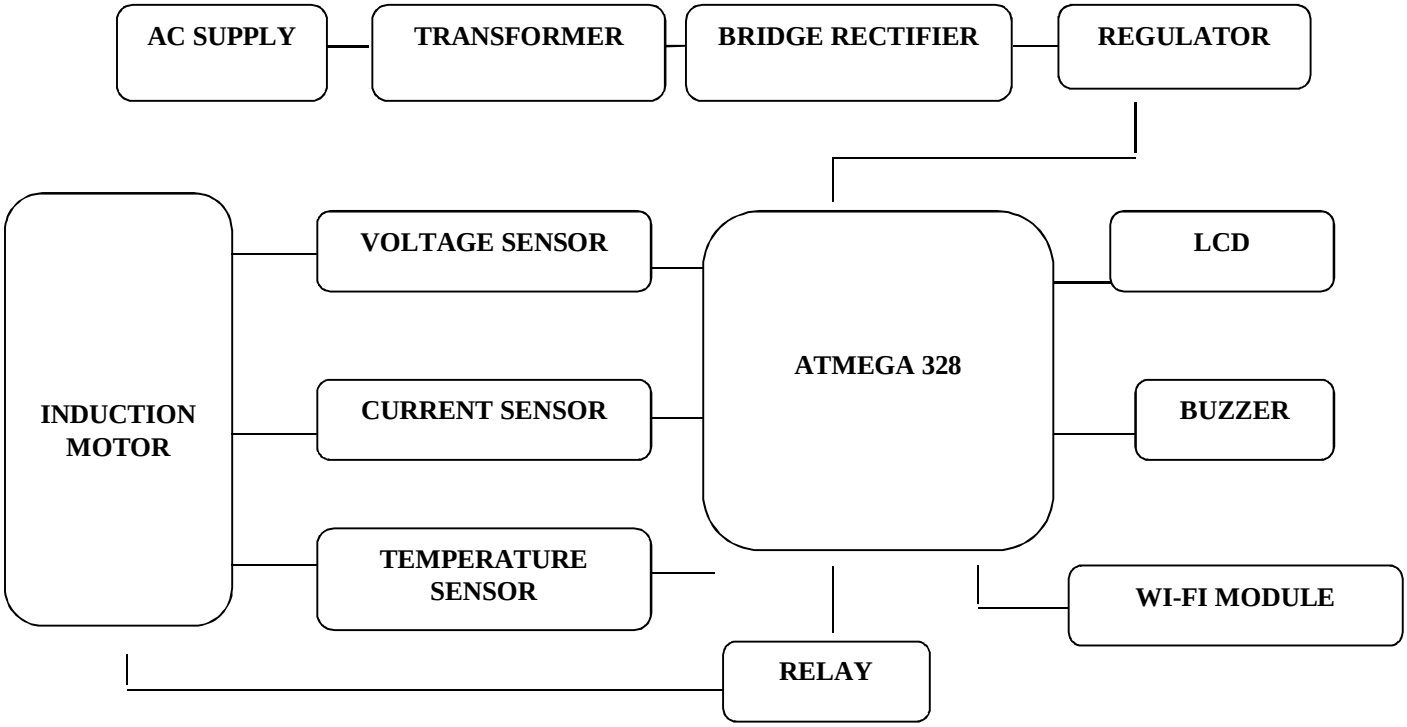

FIG.1: Block Digram

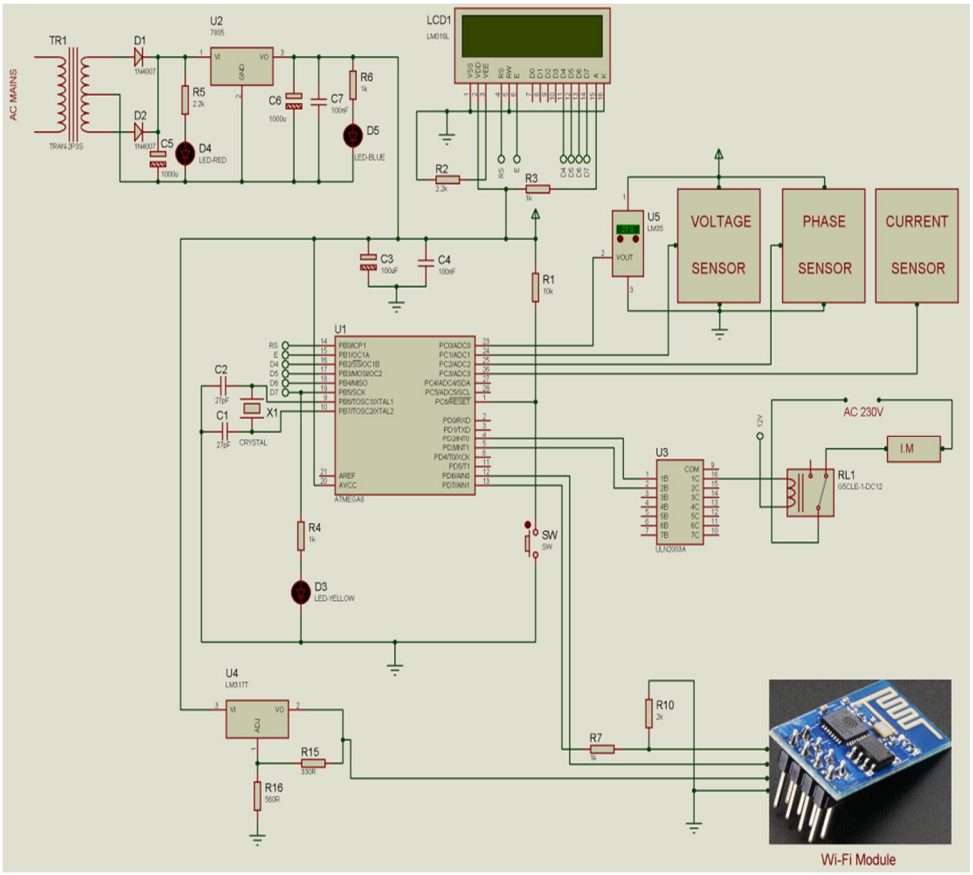

FIG. 2 Circuit Digram

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IV. COMPONENTS DESCRIPTION

A. Current Transformer

The current electrical device could be a transformer that is wont to live alternating current. It produces current in its secondary that is proportional to the present in its primary. The instrument transformers activity or protection circuits from the high voltage of the first system. A current electrical device provides secondary current that has accurately proportional to the present flowing in its primary.

B. Potential Transformer

Potential transformer are also called voltage transformer and that they are essentially step down transformer with very correct turn's quantitative relation.

It can step down the high voltage magnitude to lower voltage which can be measured with measuring instruments. This transformer has range sizeable amount of primary turns and smaller number of secondary turns. A potential transformer is often expressed in primary to secondary voltage ratio. The rating of the transformer is

C. Arduino uno (Mega)

The Arduino Mega could also be a microcontroller board supported the ATmega. Its fifty-four digital input/output pins (of that fifteen are going to be used as PWM outputs), sixteen analog inputs, four Parts (hardware serial ports), a sixteen rate oscillator, a USB association, an influence jack, associate header, and a button.

It contains everything required to support the microcontroller; merely connect it to a laptop with a USB cable or power it with AC-to-DC adapter or battery to induce started.

D. Wi-Fi Module

This module has onboard 80 mhz a low power 32-bit processor which may be used for a custom firmware. This also implies will that you will be able to host small websites testers with the an external controller. The ESP 8266 supports APSE for applications and a blue tooth coexistence stance interfaces , it contains a self-calibrated RF allowing it to figure under all operating conditions, and requires no external RF parts.

E. Voltage Regulator

The MC 78XX / LM 78XX / MC 78XX series of three terminal positive regulators are available within the package and with several fixed output voltage, making them using within the big selection of an application. Each type employs internal current limiting, the thermal shutdown and the safe area protection was making it essential adequate. If the adequate heat sinking is provided they will deliver over the 1a output current.

F. Relay

A type of relay which will handle the high power needed to directly management an electrical motor or different hundreds is termed as contactor.

Solid-state relays management power circuits with no moving elements, instead employing a semiconductor to perform change. Relays with tag operating characteristics and customarily multiple operating coils unit used to shield electrical circuits from overload or faults; in trendy power systems these functions unit of measurement performed by digital instruments still referred to as "protective relays".

V. CONCLUSIONS

In this paper we have used multiple sensors like a temperature sensor, a voltage sensor, a current sensor. As the respective condition is detected in the microcontroller and takes action and show in microcontroller. This whole system updates data on the thing-speak server using an internet connection and the graph is plotted in the server.

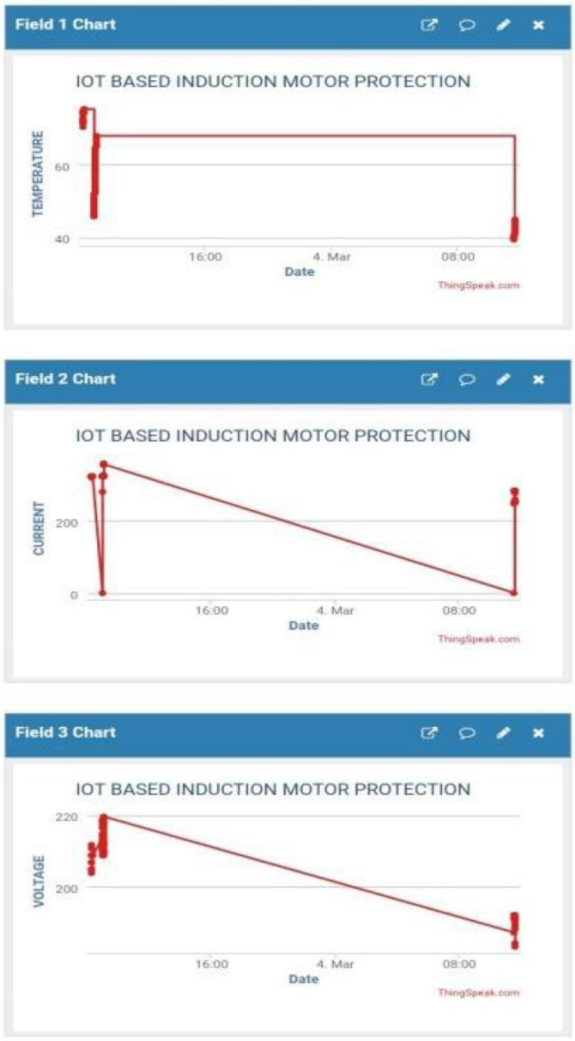

FIG.3 Graph

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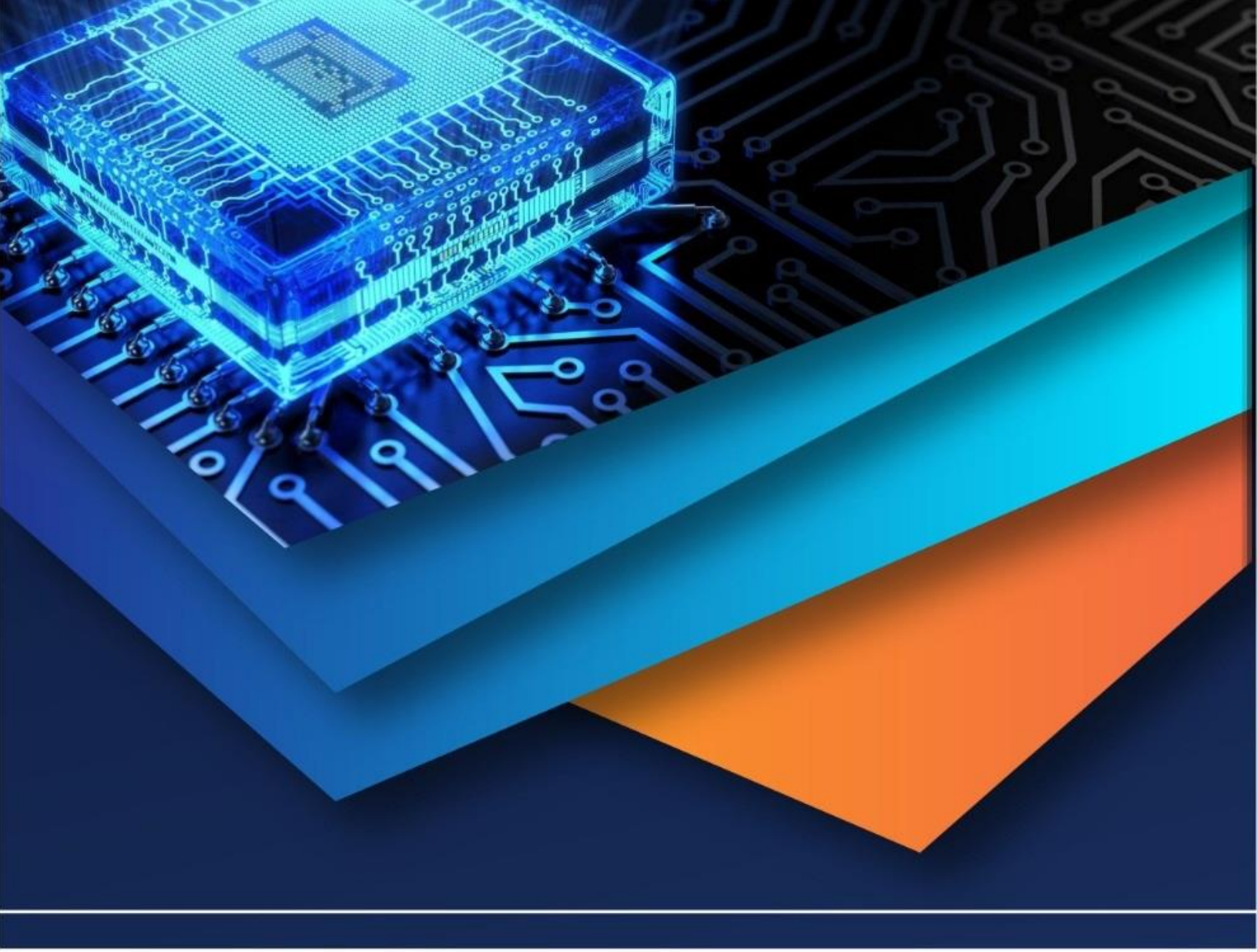

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