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Internet of Things Based Real Time Transformer Performance Monitoring System

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Abstract: ***With automation get set to rule the world it comes across as no surprise to see the humongous growth in the development of technology when it comes to see the plethora of applications boiling down to Internet of Things (IOT). As a large number of transformers are present far and wide it is difficult to monitor the condition of every transformer manually of every single transformer. So automatic data acquisition and transformer condition monitoring has been an important issue. In this proposed system we use the transformer monitoring and control coupled to the mobile embedded system to monitor load currents, over voltage, transformer oil level and oil temperature. The implementation on-line monitoring system integrates Global Service Mobile (GSM) Modem, with single chip microcontroller and sensors. It is installed at the distribution. By the enigma of connecting the controllers to internet we indeed propose a smart controlling system wherein we control the efficient working of all the transformers within a single server accolation system.***

Keywords: Internet of Things (IOT), GSM module

I. INTRODUCTION

In the modern era the major dependency of life and to an extent the very existence is largely cruxed on the availability of Electricity. In power systems, an electrical equipment distribution transformer directly distributes power to the low-voltage users and its operation condition is an important criteria of the entire network operation. The transformer operation is the most important part of power transfer and its monitoring becomes a key role in the distribution part The monitoring devices or systems which are presently used for monitoring distribution transformer have some problems and deficiencies. According to the above requirements, we need a distribution transformer real-time monitoring system to monitor all essential parameters operation, and send to the monitoring center in time. It leads to online monitoring of main functional parameters of distribution. Abnormality in distribution transformer is checked by parameters like Winding temperature, Oil temperatures, Ambient temperature, Load current, Oil flow (pump motor), Moisture and dissolved gas in oil, LTC monitoring, Oil level, Bushing condition [1]. Overloading, oil temperature, load current and ineffective cooling of transformers

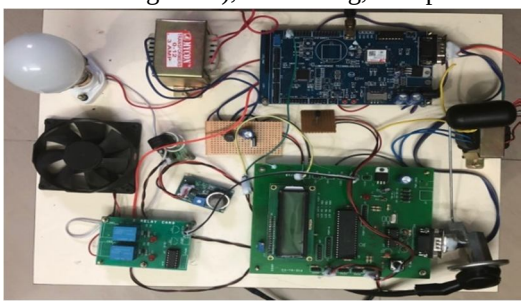
II. EXISTING TECHNOLOGY

The distributed transformers is an electrical equipment system which distributes power to the users directly Their life is significanty reduced due to overloading and therefore resulting in power system failures, loss of supply to customers and ther by effecting power system reliability . The monitoring systems in existence are manually monitored . It is very difficult to monitor the working condition of every single transformer manually and it has got some inbuilt deficiencies and problems

A. Proposed Technology

The major crux of this project is themed on the online monitoring of the distribution parameter can provide useful Information about the transformers health which will help the utilities to optimally use their transformers

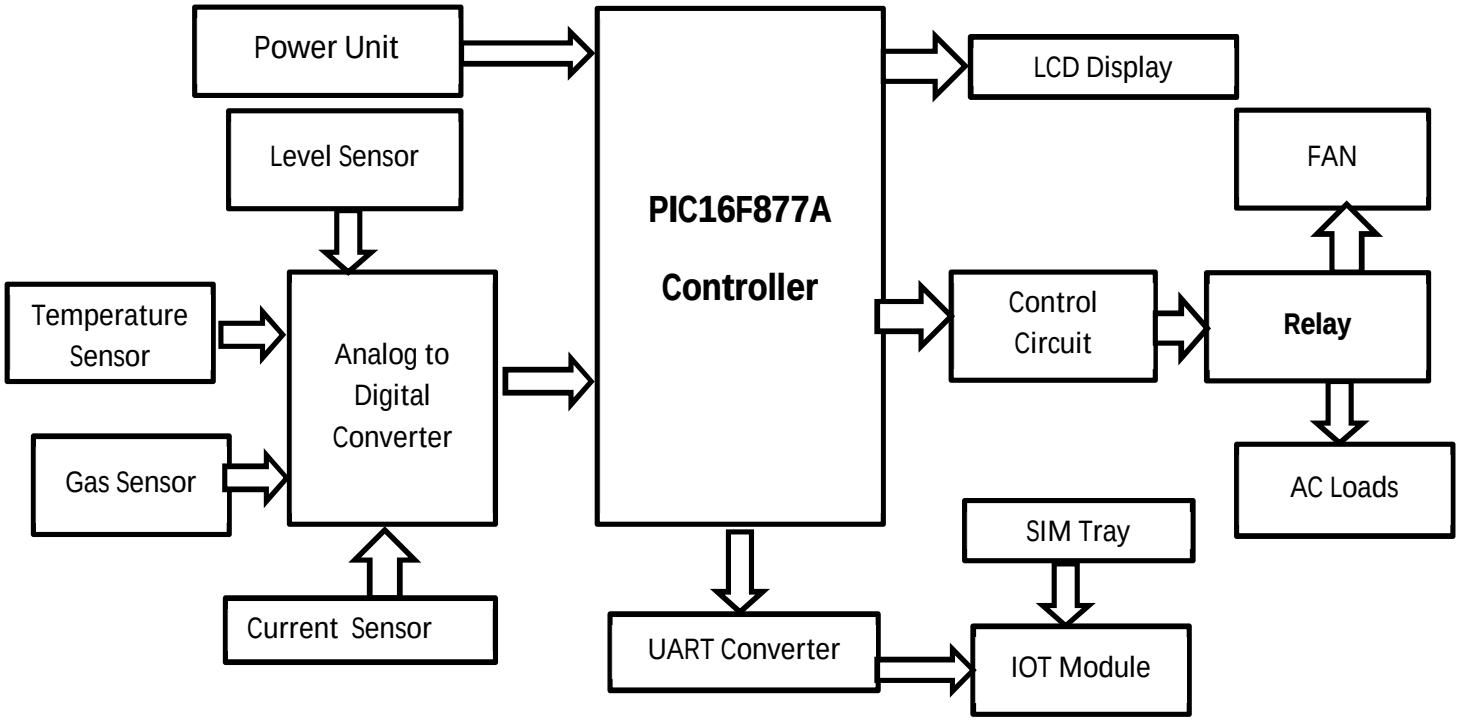
This is proposed a model of real-time transformer monitoring system using iot. This is classified in four parts- Power supply (230v step down transformer, bridge rectifier converter and regulator), controlling, data processing and data uploading.



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Block Diagram



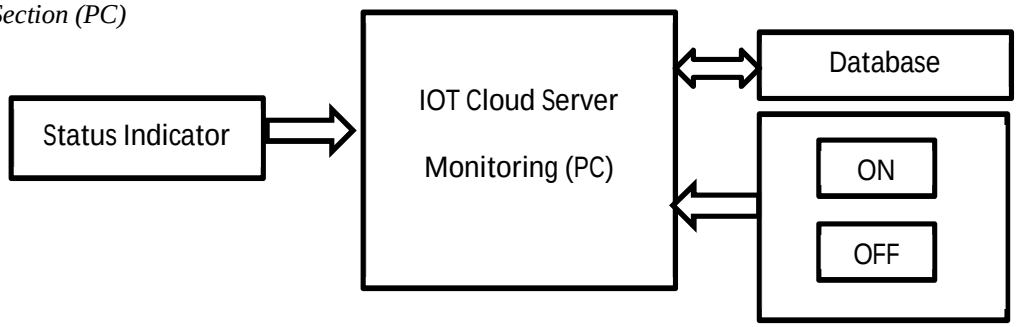
B. Hardware Requisites

1) *Power Unit:* Power unit which supplies the power to the arduino board. In this case we use a step down transformer to get a 12v Ac supply.
2) *Level Sensor:* Level sensors detect the level of liquids and other fluids and powders that exhibit an upper free surface. A level sensor is a device for determining the level or amount of fluids , liquids or other substances that flow in an open or closed system . There are 2 types of level measurements continuous &point level measurements
3) *Current Sensor:* It measures the current in in the transmission line.It has 2 pins data out and ground.
4) *Buzzer:* A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or key stroke.
5) *Temperature Sensor LM35:* The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly-proportional to the Centigrade temperature. The LM35 device has an advantage over linear temperature sensors calibrated in Kelvin, as the user is not required to subtract a large constant voltage from the output to obtain convenient Centigrade scaling.

C. Internet Of Things (IOT)

The major part of this project is the controlling of transformer by using INTERNET and therefore knowledge about INTERNET OF THINGS becomes mandatory . The enigmatic jargon is themed on MACHINE TO MACHINE (M2M) communication . The Consequently, IoT is not a new science or technology, as it is sometimes erroneously portrayed, but, rather, an infrastructure architected and supported by what can rightfully be called “Internet of Things technologies.”

IOTSection (PC)



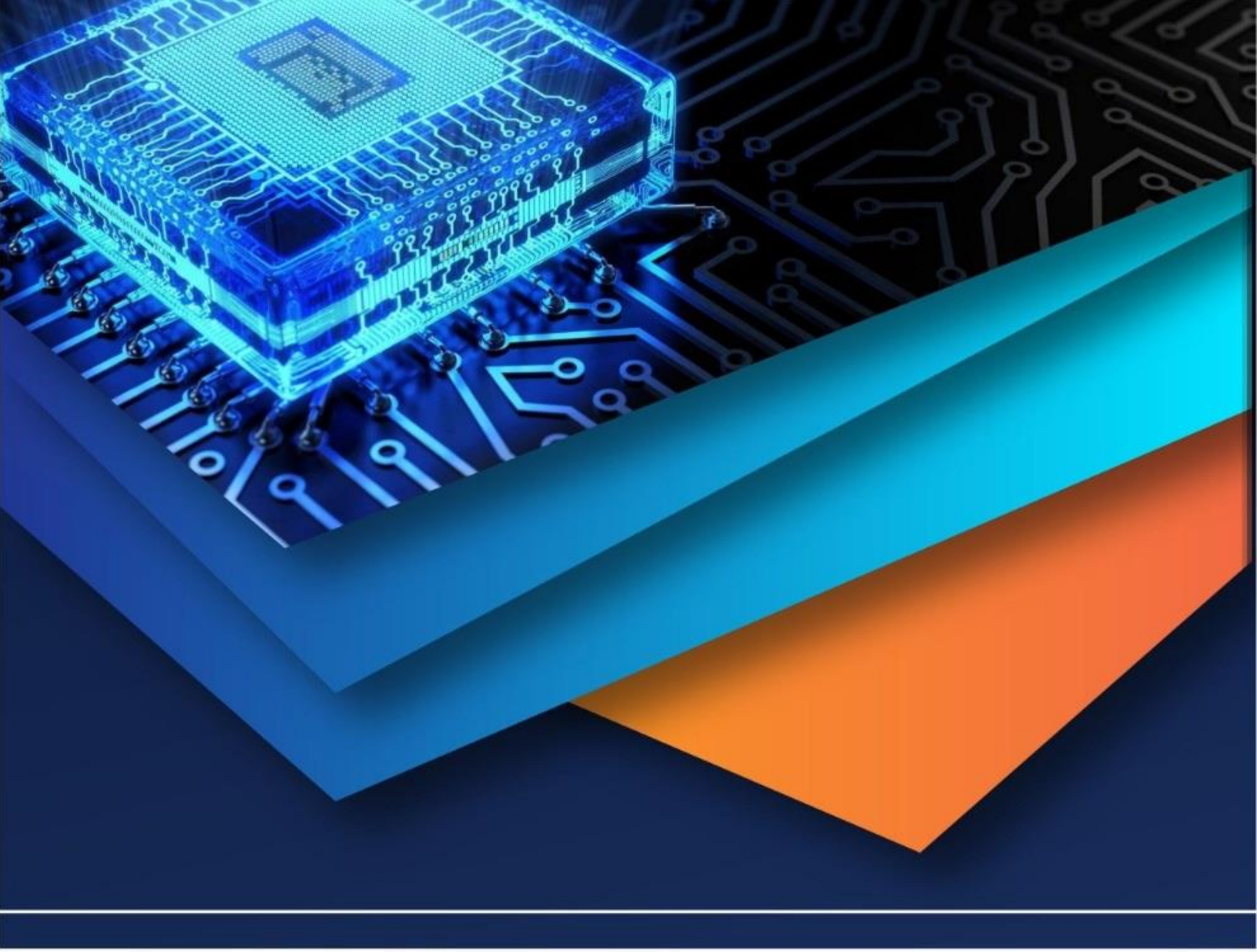
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III. CONCLUSION

The distribution of manufactured electricity from the producer to the consumer is a very important in the dynamics of power distribution . The existing system of monitoring the health of transformers is such a time consuming and tedious method wherein the condition of working of every single transformer has to be checked manually but we have modernized it using IOT . We have online monitoring system using GLOBAL SYSTEM MOBILE (GSM) . The various transformer parameters are being taken care of with the help of sensors and monitored. The alarm levels are set by the controlled and constnant monitoring is done. Once the safe level is barred it sends a alert message to the control room . The transformer overloading should be reduced to increase the life of the transformer as possible.

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