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IOT BASED TRANSFORMER MONITORING AND CONTROL

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Abstract: Distribution transformer are one of the most important equipment in power network **.** Because of large amount of transformer distributed over a side are in power electric system the condition monitoring is important issue. As per report, maintenance as well as replacement of transformer is found to be an expensive for all companies, keeping this factor in mind, IOT based distribution transformer monitoring system is develop In this work to monitoring health condition of distribution transformer on regular intervals. Health index is determined on the basic of changes in voltage, temperature variations and load ability, which are measured using sensors. The main aim this system is distribution transformer monitoring and controlling through IOT. Also, it SMS to central database via the GSM modem for further processing.
The idea of on-line monitoring system mixes a global service mobile modem, with chip microcontroller and different sensors.

Keywords-IOT,Transformer,Temperature sensor, current sensor.,oil level sensor,Relay,Aurdiano.

1.INTRODUCTION: Transformer are the foremost important equipment of power grid . If the health of transformer are better longer .transformer are employed in many application i.e from small project to mega industries .In many power companies ,they are using supervisory control and data acquisition system for monitoring of transformer but this techniqe is quit expensive and required plenty of manpower . An influence cable is one among high important need and features of an IOT based monitoring system. Distribution transformer exist , from our homes to the industries ..sudden breakdowns have to be curtailed so as to attenuate the break down time ,to reduce the upkeep cost and to increase the life time of DTs.

The most drawback of above these system are that they're unable to provide information about current overload and voltage overload and overheating of transformer oil .overload affects the efficiency of transformer and electrical distribution system. thank to these, transformer life is reduced. So, the designed system involves automatic of load to avoid damage to the transformer because of overloading. An IOT based environment consists of various sensors, communication medium and devices etc. through which they process information among one another .IOT based devices sharesensor data through cloud and processes accordingly which might be analyzed and might be used for deciding accordingly. So, This purposed paper presents an implementation of IOT based embedded system using microcontroller and sensors to observe the oil temperature of distribution transformer

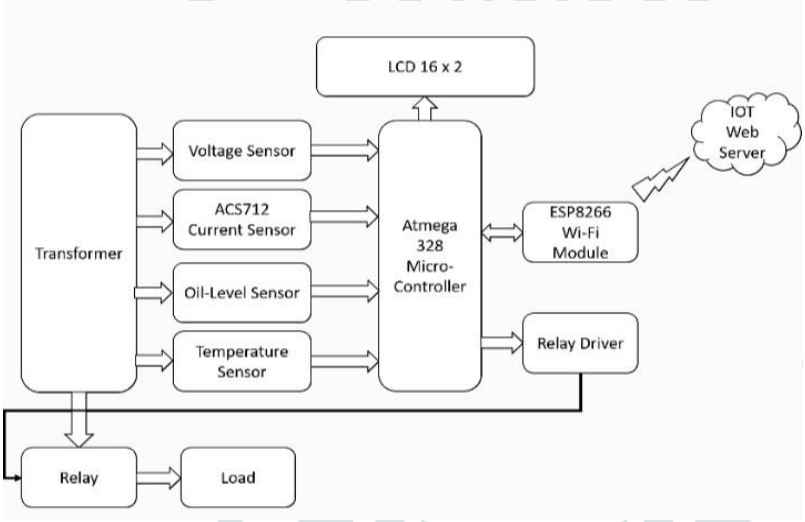
1) LITRATURE SURVEY:

Internet of Things is that the network containing many physical devices, vehicles, electronic parts, software, sensors, actuators, etc. The term IOT was first coined by Kevin Ashton within the year 1999.
Internet Of Things (IOT) associate to be sensed and connect remotely to watch the already existing network and its infrastructure.
The important vision of IOT has evolved thanks to a convergence of varied technologies, including ubiquitous wireless communication, real-time analytics, sensors, embedded systems, etc. It's a technology that enables the objects to be

sensed or controlled remotely across existing network infrastructure having numerous devices connected thereto.
Monitoring transformers health had became a fiery task. Since incase of any damaged within the internal properties of the transformer will lead to huge drawback. So it 's regularly keep an eye fixed of the transformer . This proposal is to measure data of transformer health remotely over the web using Internetof things technology. We are visiting monitor the transformer parameter like temperature, voltage, current Just in case of any equipment failure the user are notified with an alert message using wi-fi module. monitoring is the observation of transformer condition and two types: offline and online. The difference between the 2 is that in offline, the transformer is within the off state , and online, the transformer is in on state to live the data.
The transformer is to protected against both internal and external faults .Among these temperature variations , oil level fall and cargo change require regular monitoring to safe guard the transformer . during this system we are measure all parameters to damaged transformer. Here, we used four sensors i.e temperature, voltage, current, oil level. All sensors sense all data of transformer parameter and send themto remote location .
These all sensors are connecting to the microcontroller, The real time data is also seen at the sending end LCD display interfaced with the microcontroller.

2)**EXISTING SYSTEM:** In many power companies, use supervisory control and data acquisition system for monitoring health of transformer , the extending system is a chic proposition. Power transformer currently monitored manually, where an individual visit a transformer site , for maintenance and taking record purpose. But main drawback of those system are, cannot provide information about overloads and overheating of transformer oil . because of these, transformer life is reduced

3) BLOCK DIAGRAM:



A) Transformer:

The major part of our system is the transformer . In this case, we employed center-tapped step-downtransformer 50hz at 220 volts AC input.This transformer is often a small inexpensive package.

B) voltage sensor:

The Arduino board analogue sensor detects the voltage on the analogue pin and converts it to a digitalformat that the microcontroller can use. Voltage sensor may even be a device that measures the electrical voltage flowing through a wire and produces a signal inversely proportional to it

C) Current sensor:

The AC or DC current starting from +5A to -5A, +20A to -20A and +30A to -30A can be measured by the ASC712 current sensor. This sensor also functions as a wire natural phenomena detector .This demonstrate during tutorial thanks to display measured value of currents on LCD and also the because of send this data to computer using communication of Ardiuno.

D) Temperature sensor:

The DS18B20 could even be a 1-wire programmable temperature sensor from maxim integrated. It's widely. It's widely accustomed measure temperature in hard environments like in chemical solution, mines or soil etc. It can measure an honest good range of temperature from -55 degree celcius to +125 degree celcius with dependant accuracy.

E) Oil Level Sensors(ultrasonic sensor):

An ultrasonic level transmitter is mounted on the simplest of the tank and transmits an ultrasonic pulse down into the tank. This pulse, travelling at the speed of sound, is reflected back to the transmitter from the liquid surface. The ultrasonic transmitter transmits an ultrasonic wave travels in air and when it gets objected by any material it gets reflected wave is observed by the ultrasonic receiver module. We placed this sensor is top of temperature sensor to live transformer oil level.

F) WiFi Module:

The ESP8266 can be a really user friendly and low cost device to produce internet connectivity to our project. The module can work both as a access point and as a station ,hence it can easily fetch data and upload it to the web making IOT as easy as possible.

4) FLOW CHART DEVICE

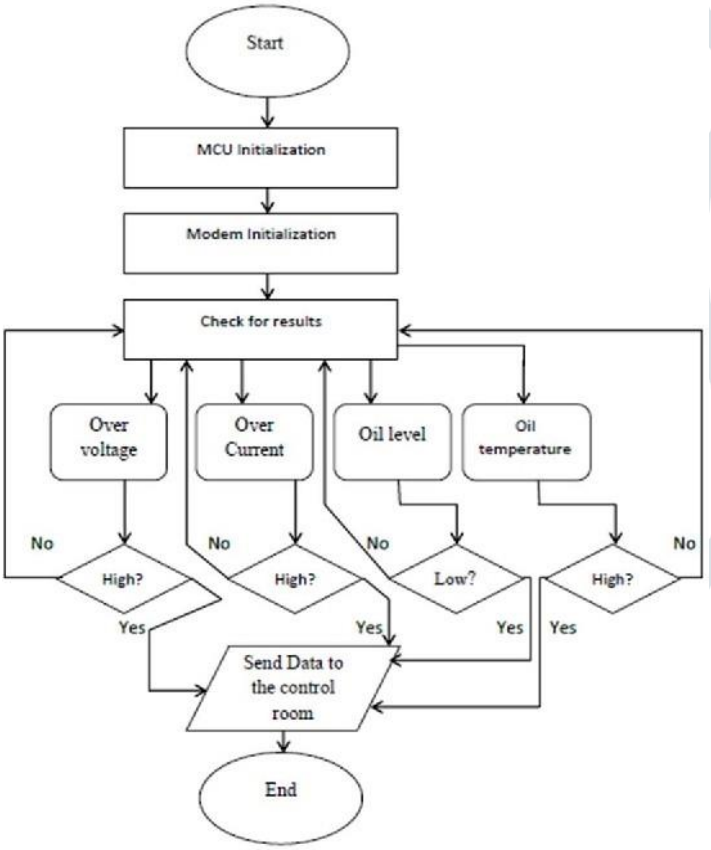


Fig. 1: Flow chart of THMS system

5) CONCLUSION:

An IOT based transformer monitoring system for power transformer wade-signed, implemented and tested. It's quite useful as compared to manual monitoring and also it's reliable because it isn't possible to watch always the oil level, oil temperature rise, ambient temperature rise, load current manually. A server module added to the current system to periodically receive and store transformer parameters information about all the ability transformers in an exceedingly database application. After receiving message on any abnormality, we are able to take immediate action to forestall any catastrophic failures of power transformers.

We'd like not should have to check all power transformers and corresponding phase currents and voltages and thus we are able to recover the system in less time and faults before any uncertain failures thus leadingto significant cost saving a s well as improving system reliability.

The proposed technique with results has shown that the protection scheme work s properly with accuracy, sensitivity of this scheme very high for the abnormal and faulty conditions. Transformer Health

Monitoring will help to spot identify or recognize unexpected situations before any serious failure, which

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