



MONITORING OF INDUSTRIAL ELECTRICAL EQUIPMENT USING IOT

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Abstract: The fire outbreaks in Industries like petroleum, chemicals, oil, and gas have a high risk, that could lead to huge destruction, loss of property and the vast majority of all, deficiency of lives. It is vital to have some system that can keep the premises make secure and also inform the authorized people within the specified time if any incident takes place. IOT and Arduino based industrial issue recognition project is intended to recognize fire (using smoke and temperature sensor) and LPG leakage (using LPG gas sensor). This project utilizes IOT and sends data to a site. Internet Of Things (IOT) is basically, the network of 'things' by which the physical things can exchange the data with the help of sensors, electronics, software and availability. These systems don't need any human association.

Index Terms - LPG leakage ,IOT, Smoke and temperature sensor Component

I. INTRODUCTION

In the field of internet of things and the smart devices [1] [2], a very important point is remote monitoring of large facilities and the remote control of the system is in proper function[3][4]. Commonly behavior/malfunction which early detect the environmental health risk assessment and emergency management of the remote monitoring systems. The remote system monitoring the industrial automation that helps manufacturers to reduce overall amount by minimizing, improving productivity and smooth moving support. The necessary parameters such as temperature and humidity are lined throughout the day so to notify the moment. A parameter is sloping, having a tendency outside of the unacceptable range. In this way the equipment should reliability and productivities are increased and maintenance costs are optimized. The monitoring systems may receive the data from the sensors, telemetry streams, user inputs and software procedures.IOT (Internet of Things) creates a high platform of application in the fields. For example, we can write the medical system, traffic control systems, home automation, monitoring the environmental etc. In the field of computing, IOT is trying to take a high amount of change. For that reason, it is very much simple to understand that energy management system using IOT is a great contributor to keep away from the destruction of power monitoring and controlling. Embedded systems are the electronic device that can make into one microcontroller according to their implementation. The major purpose of a microcontroller is to make a simplify system design and certain flexibility of a system. In a device, microcontroller is used for removing the bugs, make certain modifications and new features to control the overall system. So we can easily understand that, embedded computer system is the system which added a microcontroller for performing the applications [3].

II. RELATED WORK

Picot, H. W et al 2019 is addresses some technological requirements for developing an IOT. Industrial monitoring network, whose make the use of wireless devices along with the conventional wired method to enable a series of data capture and control operations in a network of nodes. To provide a platform to host these operations, the industry standard field bus protocol mod bus TCP was used in conjunction with the LabVIEW development environment, where a graphical user interface was developed to provide the control and a visual representation of the collected data.

Shahzad, K et al 2018 have analyze the design challenges associated with realizing IOT enabled with the industrial condition monitoring having a particular focus on enabling end-devices in managing large amount of acquired data. With the help of a vibration based condition monitoring case study the challenges are analyzed in a quantitative manner and possible alternatives are explored. The results suggest that the efficient and long term condition monitoring in the smart industry in the future improvements for enabling the technologies which required designing to optimize end-devices.

Acharya, V et al 2017 have proposed an IOT based efficiency monitoring system for biogas plants. Android based application is designed to act as an SMS gateway which gives a free replacement of commercial solution. A dashboard plotting the usage statistics is designed to help the plant administrator to monitoring the parameters.

Yavari, A et al 2019 have proposed a IOT-based solution that provides a real-time detection of hydrocarbon pollution that can be generated by retail fuel outlets (which referred a service or a stations). Our solution includes a low-cost and highly accurate the fiber optic sensor that can be detected the hydrocarbons in ground water and it can be easily deployed the existing monitoring the system.

D'Aloia, M et al 2020 proposed the design of the module for remote and real-time monitoring of environmental parameters. The architecture is based on the micro service and adopts the 2G data network communication.

Gan, S et al 2018 presents a design of an IOT (Internet Of Things) based interactive system which combines a non-invasive sensors and the data acquisition apparatus, robust communication networks, cloud based data's and web server to achieve a real-time monitoring of energy usage in the industries. The energy consumption is collected the data and published to the data centre automatically through the wireless communication network using the MQTT protocol. When a web server driven by the Apache is developed to provide a human-data interaction dashboard in B/S (Browser / Server) structure.

Chaiwong K et al 2019 have studied the investigation of the temperature by monitoring the gasification process of the stove by using IOT system which comprise a Raspberry Pi 3 model B as a single-board micro computer that connected to the internet and operated along with the mobile application that act as a system monitoring of the stove temperature in the real time. The production and efficiency of the gasification process were considered by the controlling airflow inlet to the stove that optimized for the conversion.

Alam, S. U. et al 2019 provided an energy consumption monitoring the system that provided real time visualization energy at the device level. IOT added a new dimension that should control and monitor the system from anywhere.

Zhao, L et al 2019 developed a high speed IOT based monitoring system with recording functions and implemented a power system. Due to the high speed and reliability, an FPGA embedded controller is adopted in this system. The IOT platform provides the remote visualization for the system operators in real time.

Aalsalem, et al 2017 have proposed an intelligent IOT based monitoring system which involves smart objects for reliable and efficient monitoring. The smart IOT objects are capable of sensing important parameters like pressure, temperature, vibration and reliability deliver the sensed data to the control center.

Balaji, Y et al 2019 propose an IOT based monitoring system in the mid-stream, iLoLeak detect that can improve the quality of operation by analyzing the data received from the field using LoRaWAN enabled the sensors like flow meters, pressure and temperature sensors.

III. PROPOSED SYSTEM

This system describes the design of the development and testing of a microcontroller. It should monitoring the current and voltage of the devices. Our new system can control the technical condition of the industry in terms of their load. It helps to define the warmest region, what can be evaluated like a dangerous zone for human or production. Early diagnosis is one of the important operations in the industries. In this project, we provide a monitoring industry system that provided a real time visualization of all the sensor values in the devices. Here we used Arduino D1R1, which is a Wi-Fi board with ESP8266. A relay is used for switching purpose which we can control from the server. A current sensor is used for sensing the current from the level of load. ADC is used to making the data digital type that we can easily understand. The user interface is developed by the wemos D1 R1 server and the data will be uploaded in the server using internet. The potential transformer work along the principle of the transformers. It helps to convert the voltages from high to low. Here an amplifier is a circuit which can produce the output voltage, which is the product of input voltage.

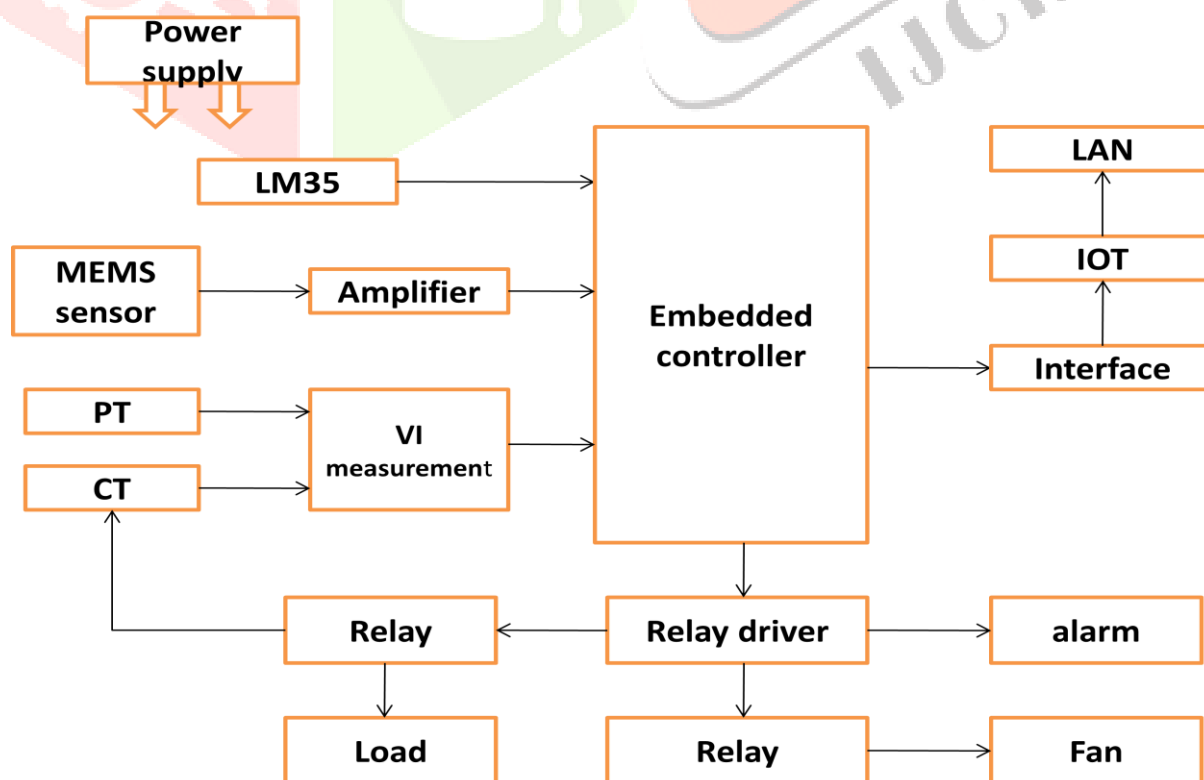


Figure1: Industrial Equipment Architecture

This proposed method measured the voltage and the current signals obtain from the sensors continuously. The measured signal described in 3 sections that transmitted a remote access point and it controls the system. The proposed method is easier to implement and it provides the method that use wired communication systems, while accepting the data from the server.

IV. RESULTS

In this section, the result and discussion of our project is simulated and figured in the following.

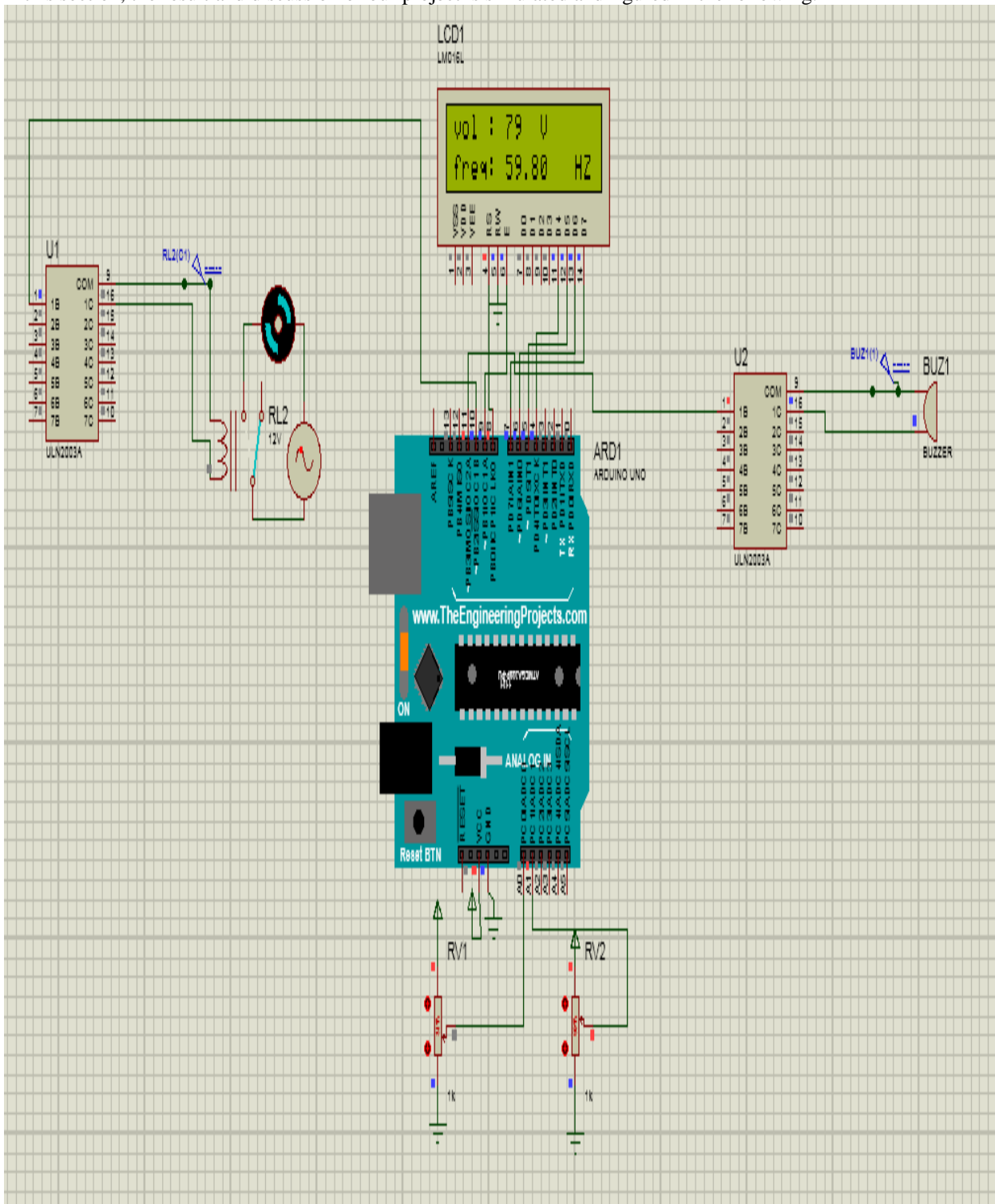


Figure2: low voltage and frequency

The above figure2 shows that the simulation results of the project and in the LCD it displays the voltage and frequencies.

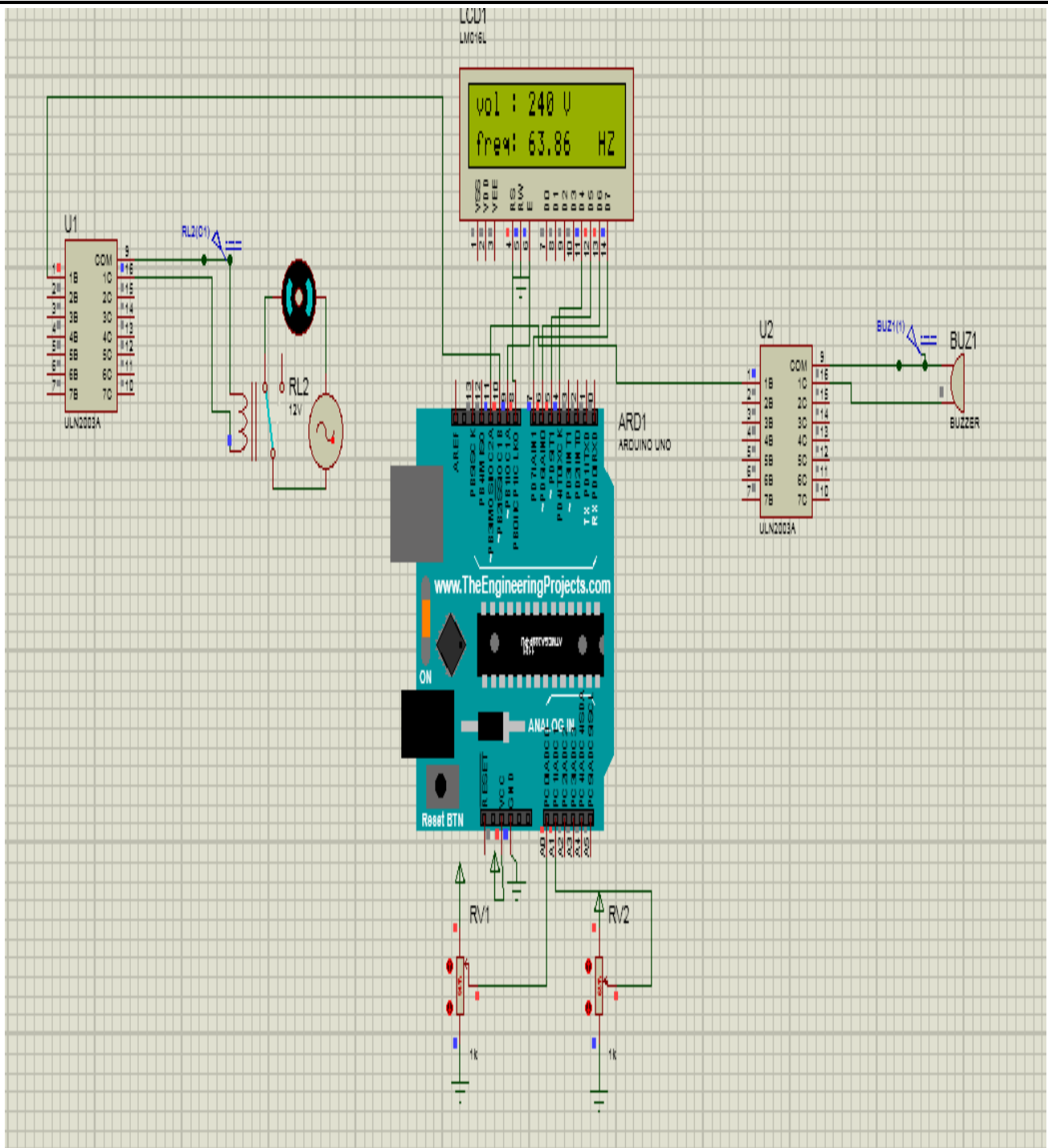


Figure3: High voltage and frequency

The above figure3 shows that the simulation results of the project and in the LCD it displays the voltage and frequencies.

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