VISHNU INSTITUTE OF TECHNOLOGY
Vishnupur, Bhimavaram, Andhra Pradesh - 534202
(Approved by A.I.C.T.E. & Affiliated to J.N.T.U Kakinada)
(Accredited by NBA & NAAC 'A' Grade)
Department of Electrical and Electronics Engineering

ELECTROZINE - 22

Research, Collaboration & Enterprise

Volume 06 Issuse 01
December 2022

08816-251333 08816-250344
hod_eee@vishnu.edu.in

VISHNUINSTITUTEOFTECHNOLOGY

(ApprovedbyA.I.C.T.E.&AffiliatedtoJ.N.T.UKakinada)

Vishnupur, BHIMAVARAM– 534202

DepartmentofElectrical&ElectronicsEngineering

VISIONANDMISSIONOFTHEDEPARTMENT

VISION:

ToberecognizedasaCentreofExcellence inthe fieldofEducationandResearchso as to produce Competent & Ethical Engineers capable enough to contribute to the society.

MISSION:

- Todevelopinnovative,efficientandproficientelectricalengineers.
- To keepthecurriculum industryfriendly,withdueregardtotheUniversity curriculum.
- Tobeaplaceforinnovativeblendedlearningandentrepreneurshipdevelopmentin multidisciplinary areas.
- To promoteethicaland moralvaluesamongthestudentsso astomakethememerge as responsible professionals.

PROGRAMEDUCATIONALOBJECTIVES(PEO's)

PEO1: ToproduceElectricalandElectronicsEngineeringgraduateswhohavestrong foundation in Mathematics, Sciences and Basic Engineering

PEO2: Toprovide intensivetraining inproblemsolving, laboratoryskillsanddesignskills to use modern engineering tools through higher education and research.

PEO3: Ability to pursue higher studies and to seek employment in a variety of engineering technology positions and work successfully in their chosen career aspirations and generate entrepreneurs.

PEO4: Toinculcateinstudentsprofessionalandethicalattitude,effectivecommunication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context through life-long learning.

INDEX

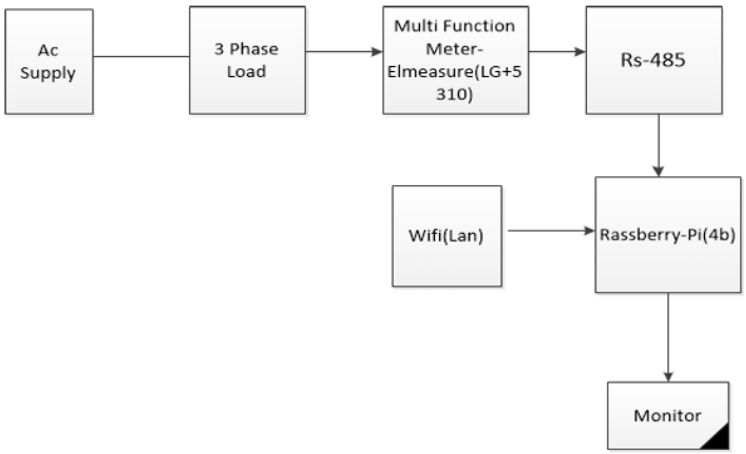
1. DESIGN AND IMPLEMENTATION OF CAMPUS ENERGY MONITORING SYSTEM USING IOT AND WEB DEVELOPMENT

A. SATYA VENI, G. SUJA BHAVANI, G. PRUDHVI,
G. HARSHA VARDHAN, G. RAJA VASANTH
SUPERVISOR: Dr. V. S. N. Narasimha Raju, M.Tech, Ph.D.

Objectiveoftheproject:

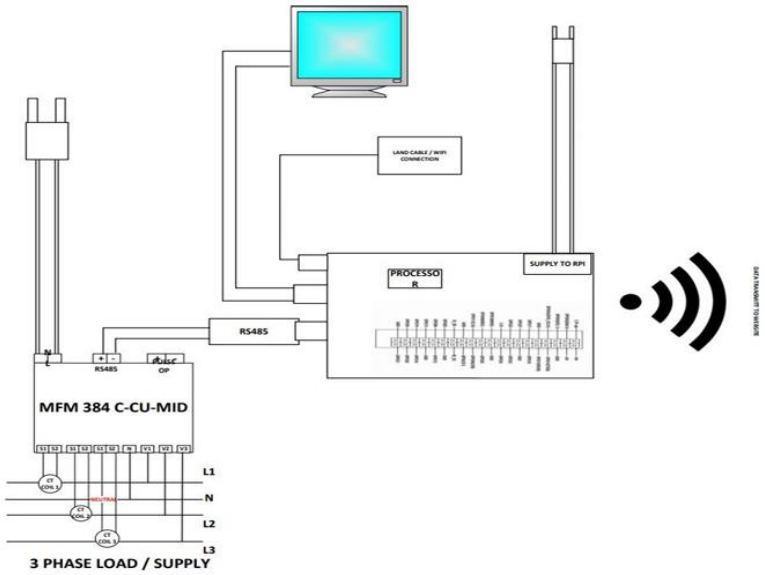
In contemporary industrial settings, the operational efficiency of induction motors holds paramount importance, as any unforeseen failure could lead to significant downtime and disruption of production processes. To mitigate such risks, this project proposes the development of a comprehensive monitoring system capable of assessing various parameters crucial to the health and performance of induction motors. These parameters include voltage, current, active power, reactive power, power factor, temperature, and sound emissions. Utilizing Internet of Things (IoT) technology, the system will employ sensors to continuously gather real-time data on the aforementioned motor parameters. The collected data will be transmitted to a centralized platform where it will be processed and analyzed. A dedicated website, built using HTML, CSS, React JS, and Mongo DB, will serve as the interface for visualizing the motor performance data. Additionally, the system will incorporate functionality to calculate the motor's runtime over a 24-hour period. By providing timely insights into motor performance and health, the proposed system aims to enable proactive maintenance interventions, thereby minimizing the risk of unplanned downtime and optimizing industrial operations. This project represents a significant step towards enhancing the reliability and efficiency of induction motor operations in industrial environments.

BLOCK DIAGRAM OF ENERGY MONITORING SYSTEM:

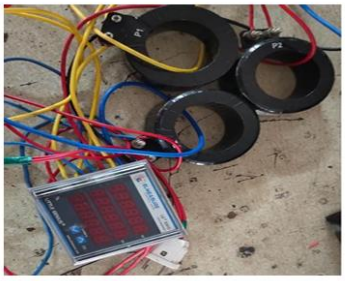


Block Diagram

CIRCUIT DIAGRAM:



HARDWARE KIT:



CONCLUSION:

In process industries, energy conservation can be achieved by many ways. However, it is essential to analyze the historical and present energy pattern of the industry to adopt a suitable energy conservation measures. In this project, it is decided to establish an efficient energy monitoring system to monitor and analyze the day-to-day energy utilization as a preliminary step of energy conservation activities. In this regard, Energy monitoring systems are considered. Many kinds of IoT devices such as, Raspberry Pi, Intel Edison, Mediatek linkit one, NVIDIA Jetson Nano etc. are available to perform this task. As compared with other data acquisition methods, the Raspberry Pi based systems are found to be the best option to accomplish the task based on their efficiency. Hence, an energy monitoring system based on Raspberry Pi is established with the help of MultiFunctioning Energy Meter. The Raspberry Pi has been programmed for the energy monitoring system and which is operating in an efficient way as detailed in this project report. This system would be very helpful to understand the day-to-day energy pattern of the company and it will be useful to implement energy conservation measures in future to operate the industry with less cost and efficient power consumption. Further, the data from the Raspberry pi is connected to the designed webpage . And helps in analyzing and monitoring of energy and power of live graphs with respect to time is shown. So that PLC is eradicated and man power is reduced . And if any faults occur the pcc in the website shows red in colour so that person can find easily from the website and get it corrected as soon as possible to run the power and energy smoothly.

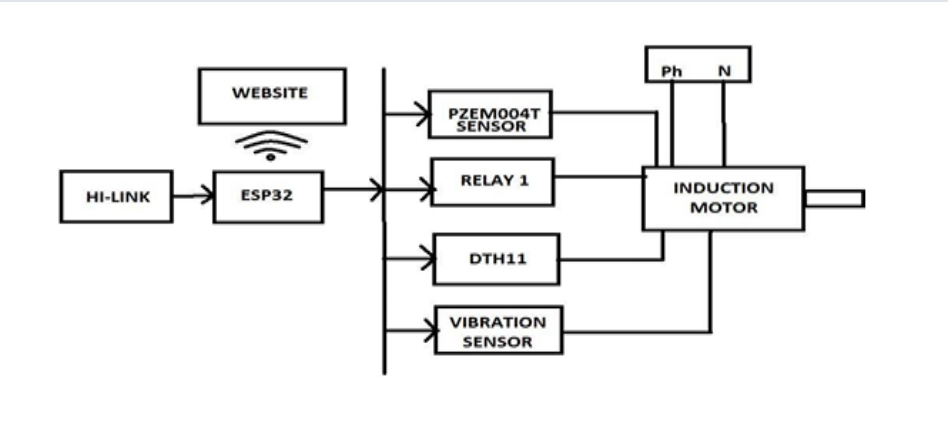
2. Health Monitoring of Induction motor using IoT with Interactive Dashboard

K.Vamsi Kumar, N . S. S. Vara Prasad Naik, M . Pavan Kalyan,
Ch . Bharathi Raja, K . Kalyan Kumar
SUPERVISOR: Mr. N. Veeraiah , M.Tech.

Objectiveoftheproject:

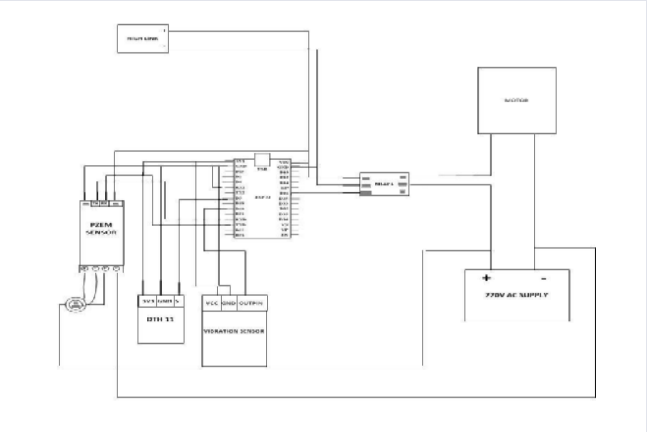
In contemporary industrial settings, the operational efficiency of induction motors holds paramount importance, as any unforeseen failure could lead to significant downtime and disruption of production processes. To mitigate such risks, this project proposes the development of a comprehensive monitoring system capable of assessing various parameters crucial to the health and performance of induction motors. These parameters include voltage, current, active power, reactive power, power factor, temperature, and sound emissions. Utilizing Internet of Things (IoT) technology, the system will employ sensors to continuously gather real-time data on the aforementioned motor parameters. The collected data will be transmitted to a centralized platform where it will be processed and analyzed. A dedicated website, built using HTML, CSS, React JS, and Mongo DB, will serve as the interface for visualizing the motor performance data. Additionally, the system will incorporate functionality to calculate the motor's runtime over a 24-hour period. By providing timely insights into motor performance and health, the proposed system aims to enable proactive maintenance interventions, thereby minimizing the risk of unplanned downtime and optimizing industrial operations. This project represents a significant step towards enhancing the reliability and efficiency of induction motor operations in industrial environments.

Block Diagram:

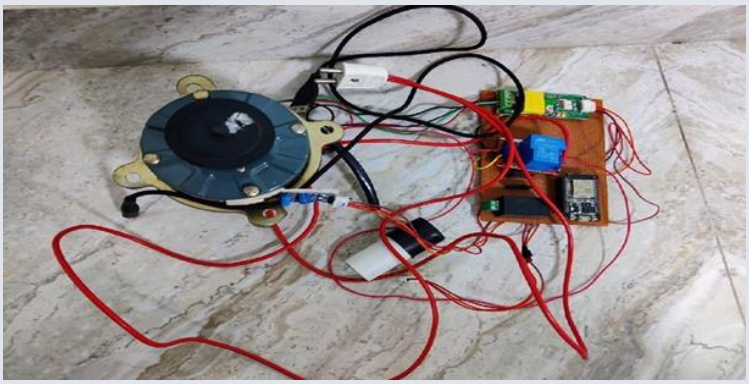


CIRCUIT DIAGRAM & Hardware kit:

HybridSystem



(a) Circuit Diagram



(b) Hardware kit

CONCLUSION:

In conclusion, the proposed IoT-based monitoring system for induction motors represents a significant advancement in enhancing the operational efficiency and reliability of industries. By focusing on critical parameters such as voltage, current, active power, reactive power, power factor, temperature, and sound, the system offers comprehensive insights into motor performance. Through the utilization of IoT devices, the system enables real-time data collection from induction motors, allowing for prompt detection of anomalies and potential issues. This proactive approach to monitoring facilitates preventive maintenance, minimizing downtime and optimizing productivity in industrial settings. The web platform, developed using HTML, CSS, React JS, and MongoDB,provides a user- friendly interface for visualizing motor parameters and analyzing data trends. This empowers industry personnel to make informed decisions and take timely actions to ensure the smooth functioning of their operations. Overall, the implementation of this IoT-based monitoring system signifies a step forward in leveraging technology to enhance industrial processes. By effectively monitoring and managing induction motors, industries can improve their operational efficiency, reduce costs, and enhance overall reliability, thereby contributing to sustainable growth and competitiveness in the modern industrial landscape.

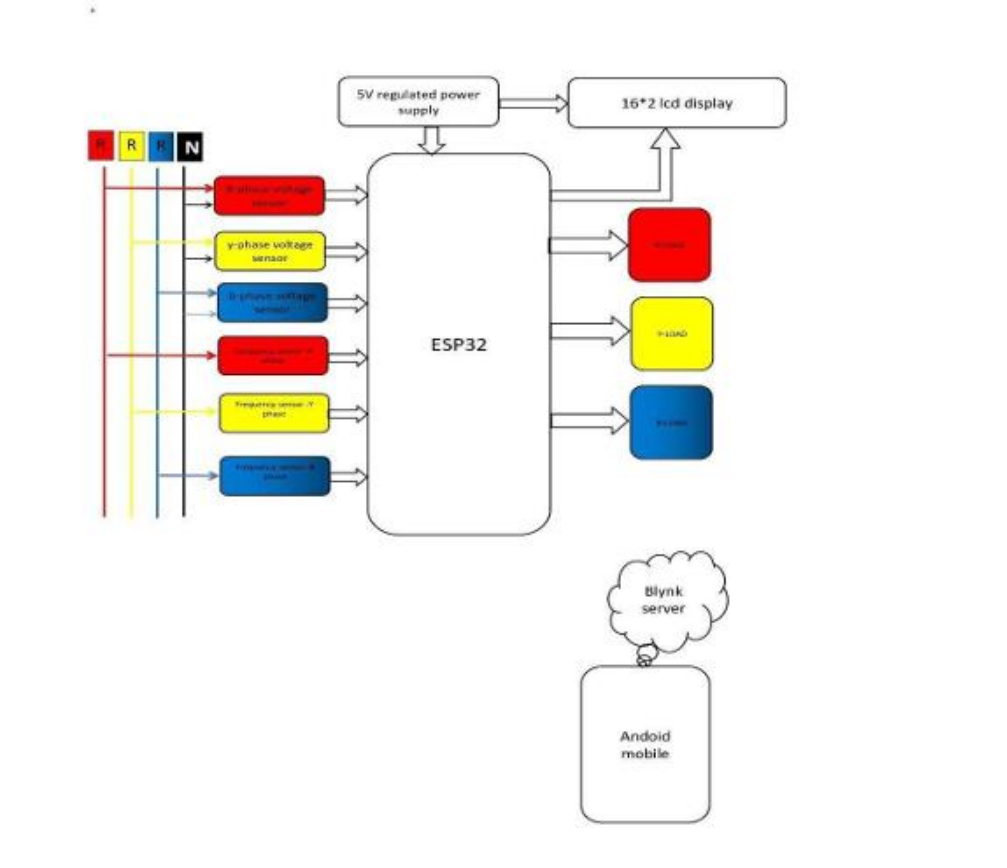
3. Detection Of Power Grid Failures Using Voltage And Frequency Variance Analysis

CH. SAI DURGA KISHORE, K. PHANISHA, D. SARASWATHI
V. SAI CHARAN RAJU, D. ABHEESH
SUPERVISOR: Mr. Ch. Phani Kumar, M.Tech

Objective of the project:

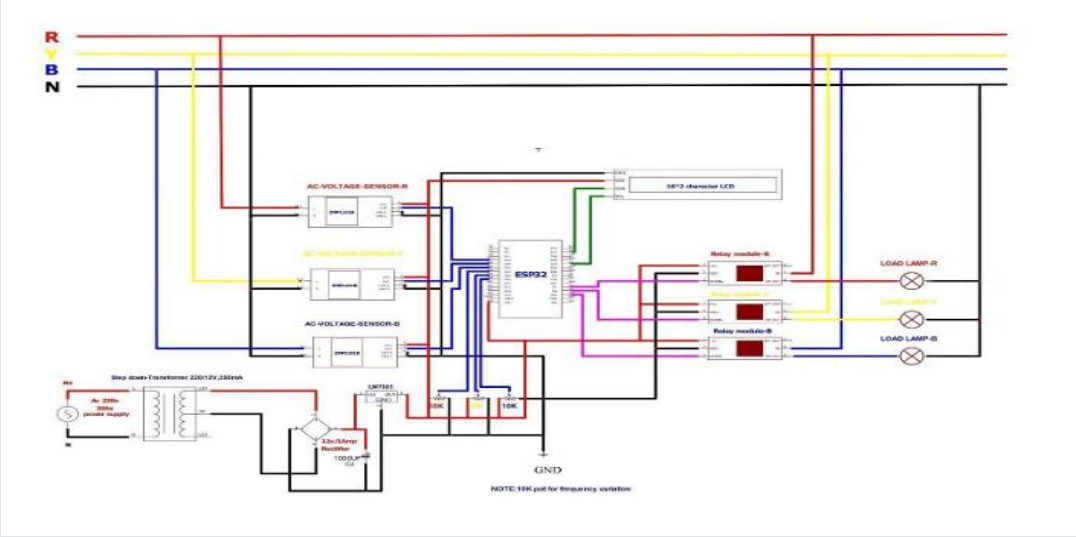
In this project we are ensuring the stable operation of power grids amidst the complexities of multiple generators working in synchronism is paramount in today's energy landscape. With numerous generators contributing to the grid, maintaining coherence in terms of phase sequence, voltage magnitude, and frequency is essential for grid stability. Any deviation from this synchronism can potentially disrupt the entire power system, leading to cascading failures with severe consequences. To address this challenge, modern power grid management relies heavily on advanced sensing technologies capable of detecting even the slightest variations in frequency or voltage magnitude of individual generators. These technologies enable real-time monitoring and analysis of grid dynamics, allowing operators to promptly identify any generators falling out of synchronism. Once a deviation is detected, automated systems can swiftly isolate the problematic generator from the grid, preventing its destabilizing influence from spreading further. By leveraging these sophisticated techniques, power plants and industries can uphold the integrity of the grid, ensuring uninterrupted energy supply and safeguarding against system-wide failures

Block Diagram:

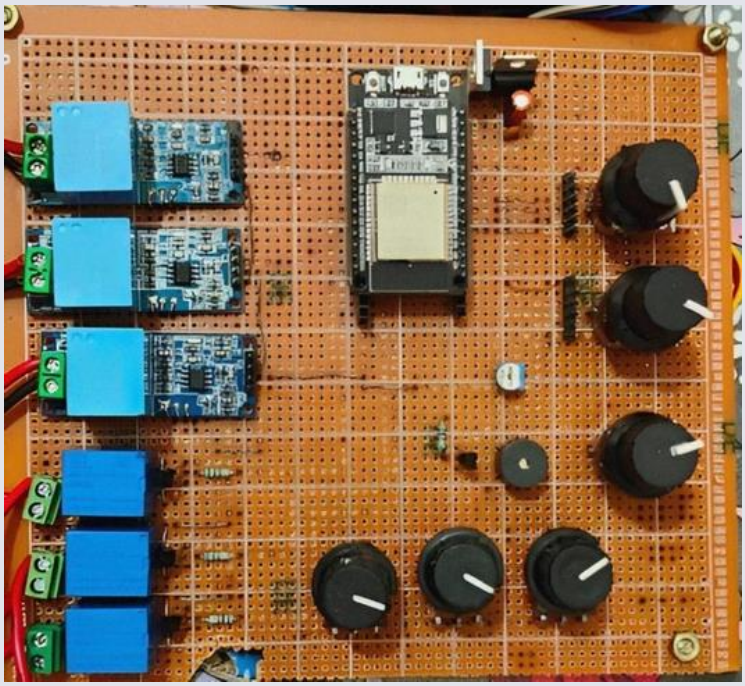


CIRCUIT DIAGRAM:

.



PCB HARDWARE DIAGRAM:



CONCLUSION:

This paper gives brief idea about developing a system to detect the synchronization failure of any external supply source to the power grid on sensing the bad voltage and frequency. Number of distributed generators connected in parallel to the grid, to supply power to the load. Each generator having follow the rules of grid. These rules involve maintaining a voltage and frequency variation within limits. When any fault occurs on grid and due to this grid broken a rules and deviation occur in voltage and frequency. When deviation occur in grid feeder is mandatory to open from grid and this process is term as islanding. This prevents grid failure or blackout.

4. A COMPREHENSIVE AC PARAMETERS ANALYZER

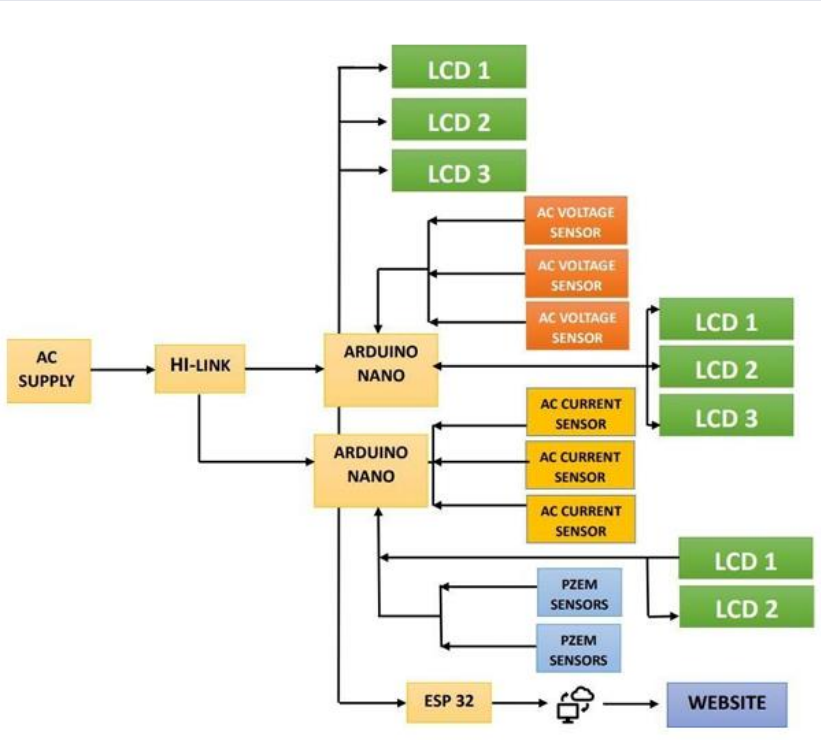
A.N.S.Nikhitha,Ch.Deekshitha, G.Pavan Krishna, K.Satya Ganesh, K.Subrahmanyam

SUPERVISOR: Mrs. D.Mamatha,M.Tech. (Ph.D)

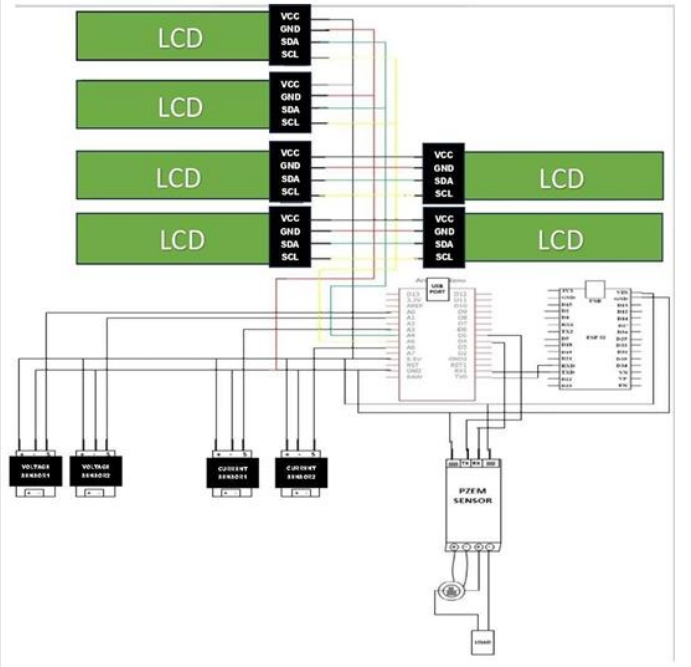
OBJECTIVEOFTHEPROJECT:

In AC machines lab we use different ranges of voltmeter, Ammeter, wattmeter and power factor. It is tedious to carry these many meters with different ranges and sometimes readings not accurate because of aging of the components present in the meters. In this project we are going to design a system using Voltage sensor (ZMPT), current sensor (SCT013b), power sensor(PZEM04) which can measure all the required ac parameters (Voltage, Current, Power, Active power, Reactive power and power factor etc.) accurately and display on LCD display. A Comprehensive AC Parameters Analyzer is a versatile electronic instrument designed for comprehensive analysis and characterization of alternating current (AC) signals in electrical systems. Developed to address the growing need for precise and efficient measurement tools in the field of electrical engineering and power electronics, the offers a wide range of functionalities, including voltage, current, frequency, power, phase angle, and harmonic analysis. Its modular design allows for flexible configuration and expansion, catering to diverse measurement requirements across various applications, from industrial power systems to renewable energy installations. Equipped with advanced signal processing algorithms and a user-friendly interface, the provides accurate and reliable measurements, enabling engineers and researchers to gain valuable insights into the performance and behavior of AC circuits. This abstract highlights the key features and capabilities of the, emphasizing its significance in advancing research, development, and troubleshooting efforts in the field of electrical engineering.

BLOCK DIAGRAM OF A COMPREHENSIVE AC PARAMTERS ANALYZER:

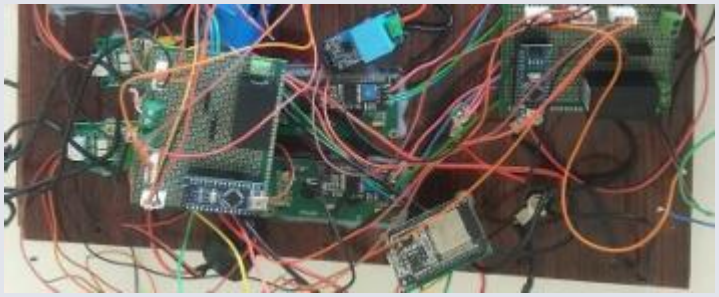


CIRCUIT DIAGRAM:



PCB HARDWARE DIAGRAM:

(a) Power Transferring circuit



(b) Power Receiving circuit

(C) Comprehensive AC Parameters Analyzer

CONCLUSION OF THE PROJECT:

The development of a A Comprehensive AC Parameters Analyzer represents a significant advancement in the field of electrical engineering and instrumentation. By consolidating various measurement capabilities into a single device, engineers and researchers can streamline their testing processes, saving time and resources. This multifunctional box offers the versatility to accurately measure parameters such as voltage, current, frequency, power factor, and impedance across a wide range of electrical systems, from small-scale circuits to large industrial installations. Its compatibility with different AC sources and load conditions makes it an indispensable tool for both academic research and industrial applications, enabling comprehensive analysis and validation of electrical systems with ease and precision.

5. SIMULATION OF INTERDIGITATED ELECTRODES GEOMETRY USING COMSOL MULTIPHYSICS

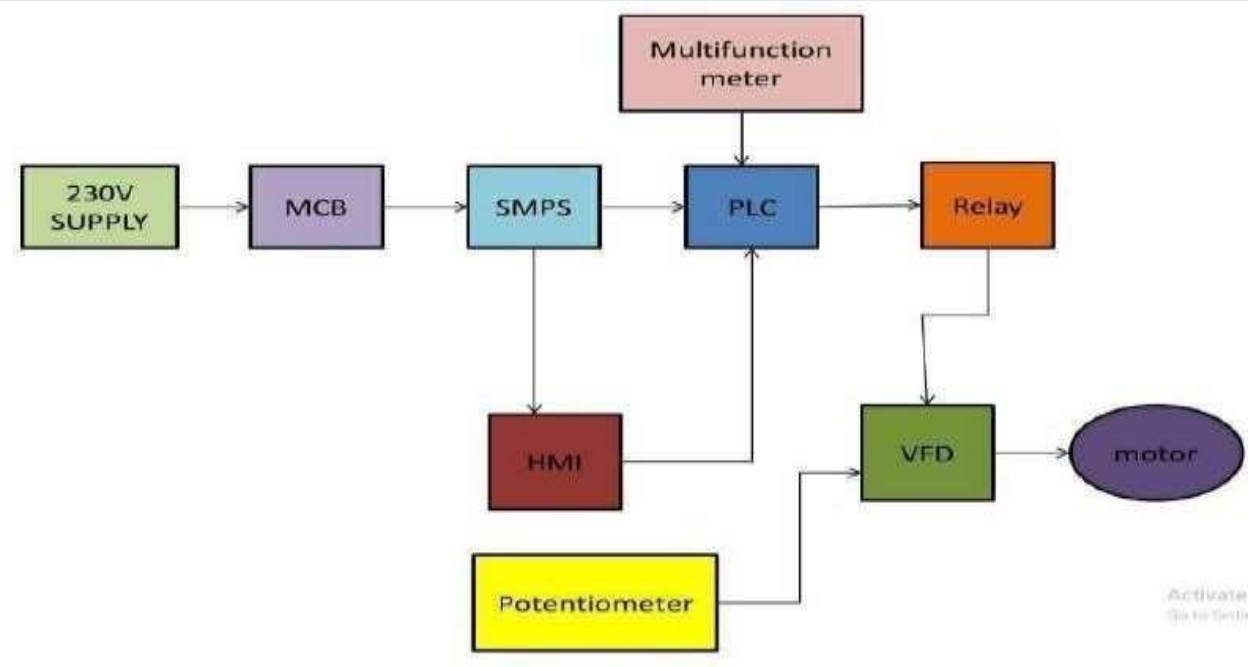
E. AKSHAYA, K. DEVI PADMAJA, G. AKHIL RATNA, K. SUMATHI, CH. JAYAVARMA

SUPERVISOR: Mr. G. SURI BABU, M.Tech

OBJECTIVEOFTHE PROJECT:

Interdigitated Electrodes (IDEs) offer a promising platform for gas sensing and biosensing applications due to their simple structural design and high sensitivity. In this study, we investigate the physical model of IDEs-based sensors and analyze the influence of geometric parameters, including gap sizes, number of fingers, and width of fingers, on sensor performance through finite element simulations using COMSOL Multiphysics. Our simulations reveal that smaller gap sizes and narrower fingers lead to higher electric field magnitudes, thereby enhancing sensor sensitivity. Additionally, we observe that the number of fingers has a significant impact on sensor performance, with an optimal design of 18 fingers yielding the highest electric field magnitude

PROPOSED BLOCKDIAGRAM:



BlockDiagram

MODULE(S) OF THE PROTOTYPE:

FRONTVIEW

INSIDEVIEW

CONCLUSION:

In conclusion, this research project advances the understanding of IDEs-based sensor design and optimization for gas sensing applications. The findings underscore the importance of geometric parameters in determining sensor performance and provide valuable insights for future research and development in the field. Overall, this research project represents a significant step towards the development of advanced IDE-based sensors with improved sensitivity, selectivity, and reliability, offering promising prospects for real-world applications in various fields including healthcare, environmental monitoring, and industrial process control.