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

Research, Collaboration & Enterprise

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VISION AND MISSION OF THE DEPARTMENT

VISION:

To be recognized as a Centre of Excellence in the field of Education and Research so as to produce Competent & Ethical Engineers capable enough to contribute to the society.

MISSION:

- To develop innovative, efficient and proficient electrical engineers.
- To keep the curriculum industry friendly, with due regard to the University curriculum.
- To be a place for innovative blended learning and entrepreneurship development in multidisciplinary areas.
- To promote ethical and moral values among the students so as to make them emerge as responsible professionals.

PROGRAM EDUCATIONAL OBJECTIVES(PEO's)

PEO1: To produce Electrical and Electronics Engineering graduates who have strong foundation in Mathematics, Sciences and Basic Engineering

PEO2: To develop problem-solving abilities, technical competency and proficiency in modern engineering tools through hands-on laboratory experience and innovaite projects.

PEO3: To prepare graduates for successful careers in industry, research, or higher education, empowering them to excel in diverse engineering and technology-related fields or become entrepreneurs.

PEO4: To inculcate in students professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach, and an ability to relate engineering issues to broader social context through life-long learning.

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1. IoT BASED VOLTAGE, CURRENT, POWER CONSUMPTION MONITORING OF DC MACHINE IN A INDUSTRY

P.YAMINI SAI, P.SAI TEJA, P.AJAY, V.DINESH, P.SATISH
SUPERVISOR: Mrs. I.V.V.Vijetha, M.Tech(Ph.D).

Objectiveoftheproject:

Electricity is a basic human necessity that is extensively employed for home, industrial, and agricultural purposes. In this way, energy waste leads nations to lose revenue. Solutions based on technology, such as The Internet of Things (IOT) connects the physical and digital worlds. These days as high end technology and internet data are available and cost of human resource (Technical staff) is going high, it is worthy to depend on smart loT system which acts autonomously according to customer requirements. In this connection we are going to attempt a project which will monitor all parameters DC machines like Voltage, Current and Power etc using voltage and current sensors (ACS712) in an industry and send the information to designed website (HTML, CSS, React JS, Mongo db etc.). The system architecture consists of sensors interfaced with Arduino Nano for data acquisition, which communicates with the ESP32 microcontroller. The ESP32 processes the acquired data and transmits it to a remote server via Wi-Fi connectivity. A web application or database hosted on the remote server facilitates data storage, visualization, and analysis, allowing industrial stakeholders to monitor and manage the performance of DC machines effectively. The implementation of this IoT-based solution offers several benefits, including real-time monitoring capabilities, remote access to data, proactive maintenance through predictive analytics, and optimization of energy usage for improved efficiency. Furthermore, the project sets the foundation for future enhancements, such as integration with machine learning algorithms for predictive maintenance and expansion to monitor additional parameters for comprehensive industrial monitoring and control. The proposed project addresses the need for efficient monitoring and management of DC machines in industrial environments, leveraging IoT technology to enhance operational efficiency, reduce downtime, and ensure optimal performance.

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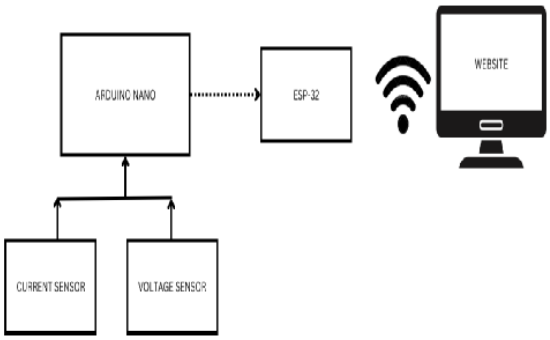

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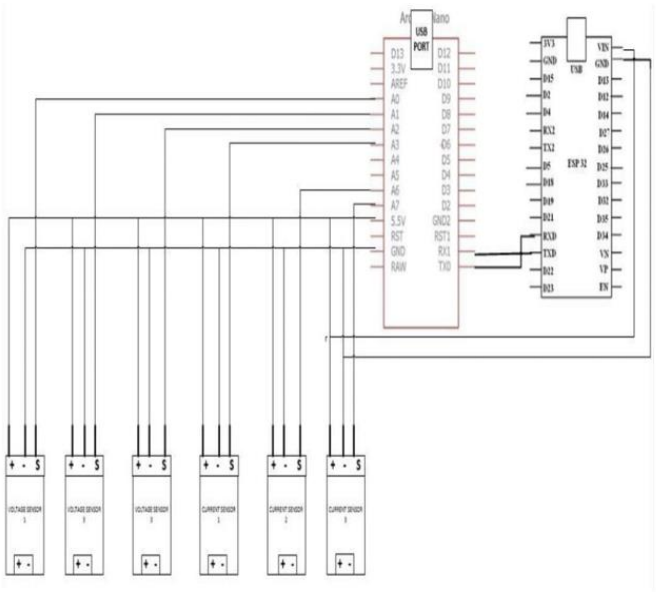

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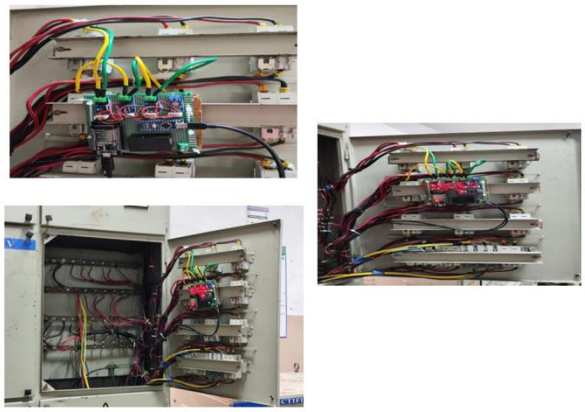


CONCLUSION:

In conclusion, the development of a IoT-based voltage, current, and power consumption monitoring system for DC machines in an industrial environment represents a significant step towards achieving enhanced operational efficiency and maintenance optimization. By utilizing advanced sensor technology, microcontrollers, and web-based interfaces, the system enables real-time monitoring and analysis of critical electrical parameters. Through the integration of components such as ACS712 current sensors, voltage sensors, ESP32 microcontrollers, Hi-Link power supplies, and Arduino Nano, the monitoring system offers a comprehensive solution for energy management and predictive maintenance. The IoT- based voltage, current, and power consumption monitoring system for DC machines in an industrial setup is a crucial advancement towards efficient energy management and predictive maintenance. This project aims to develop a comprehensive monitoring solution utilizing ACS712 current sensors, voltage sensors, ESP32 microcontroller, Hi-Link power supply, and Arduino Nano. The system records vital electrical parameters, facilitating real-time monitoring and analysis for improved operational efficiency and maintenance scheduling. This project lays the foundation for smarter and more efficient industrial operations, ultimately contributing to cost savings, reduced downtime, and improved overall productivity. This seamless data transmission process enables real-time tracking of voltage, current, and power consumption metrics, empowering industry personnel to make informed decisions regarding energy management and equipment maintenance. The IoT-based voltage, current, and power consumption monitoring system for DC machines in the industry successfully demonstrated its effectiveness in providing real-time insights, enabling informed decision-making, and driving efficiency improvements. By leveraging advanced technologies and robust components, the system offered a scalable and reliable solution for energy management in industrial settings.

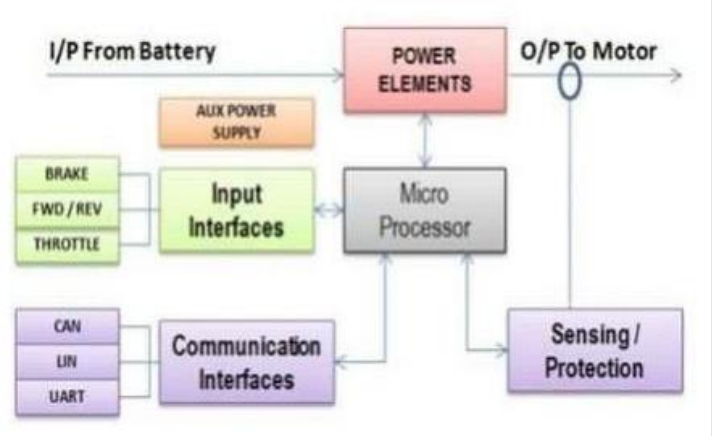
2. DEVELOPMENT AND OPTIMIZATION OF AN ENERGY EFFICIENT POWERTRAIN SYSTEM OF EV

P.THARUN, M.TEJA, P.RAVINDRA, Y.RAVI TEJA
S.NAGABHUSHANAM
SUPERVISOR: Mr.P .Ram Prasad, M.Tech.

Objective of the project:

Electric two-wheelers hold immense potential for sustainable transportation. This project addresses the challenge of maximizing their efficiency by optimizing the powertrain system. This project addresses the critical role of electric two-wheelers in sustainable transportation by optimizing their powertrain systems for maximum energy efficiency. Focusing on battery technology, motor selection, and potentially incorporating a multi-speed transmission, the project aims to design a powertrain that minimizes energy loss. Through rigorous component selection, loss analysis, and optimization techniques, the project seeks to significantly enhance the range and overall energy efficiency of electric two-wheelers. This will lead to reduced operational costs and environmental impact, paving the way for wider adoption of electric mobility in the two-wheeler market

Block Diagram:



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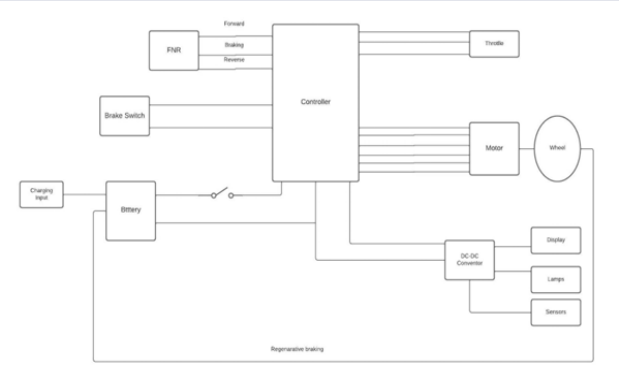

CONCLUSION:

This project focused on the development and optimization of an energy-efficient electric two-wheeler (E2W) vehicle. Through a combination of component analysis, customer needs assessment, and powertrain modeling, we successfully achieved significant improvements in the vehicle's range while minimizing battery capacity requirements. Component-Level Optimization: By meticulously analyzing individual components and their impact on energy consumption, we were able to identify areas for improvement.This could involve selecting more efficient motors, optimizing gear ratios for better power delivery, or utilizing lower-resistance wiring to minimize energy losses. Customer-Centric Design: Understanding customer priorities was paramount. We considered factors like desired range, typical usage patterns, and weight limitations. This customer-centric approach ensured the optimized E2W addressed real-world needs. Extended Range with Reduced Battery Capacity: The project's success lies in achieving a substantial increase in the vehicle's operational range without requiring a proportionally larger battery. This translates to several benefits: • Reduced Cost: Smaller batteries are generally less expensive, leading to a more cost- competitive E2W. • Lower Weight: A lighter battery translates to a lighter overall vehicle weight, further improving efficiency and potentially enhancing acceleration or handling. • Packaging Advantages: A smaller battery allows for more flexibility in vehicle design and packaging, potentially creating more storage space or enabling a lower floorboard for improved ergonomics.

3. IOT BASED AUTONOMOUS WATER DRAINING SYSTEM FOR RAILWAY UNDER BRIDGES WITH REAL-TIME DATA MONITORING

K. JAYASREE, K. SAILESH , CH.S.N. SAIRAM, K.SHANMUKANAND, A. PRATEEK

SUPERVISOR: Dr. S. PRAGASPATHY M.E., Ph.D.

Objective of the project:

In developing countries like India, the usage of vehicles is increasing day by day for transportation purpose. This results in terrible traffic issues near railway crossings. In recent days, railways under bridges are common to address the traffic issues. Generally, under bridges are constructed lower than ground level and stagnates water during rainy season. To drain the water from the under bridge it requires a dedicated manpower round the clock, and it is very expensive. In this project, an IOT system is developed to identify the water and it will automatically switch on the pump motor to drain the water from the under bridge. This IOT system can be connected in different areas of the under bridges in that zone. And the information about the clearance of water is directly transferred to designed dashboard for data visualization which is handled by the person in charge. This proposed IOT system control is developed by using an Arduino integrated development environment and dashboard which is designed using HTML, CSS, React JS, Node Js, Mongo dB etc.

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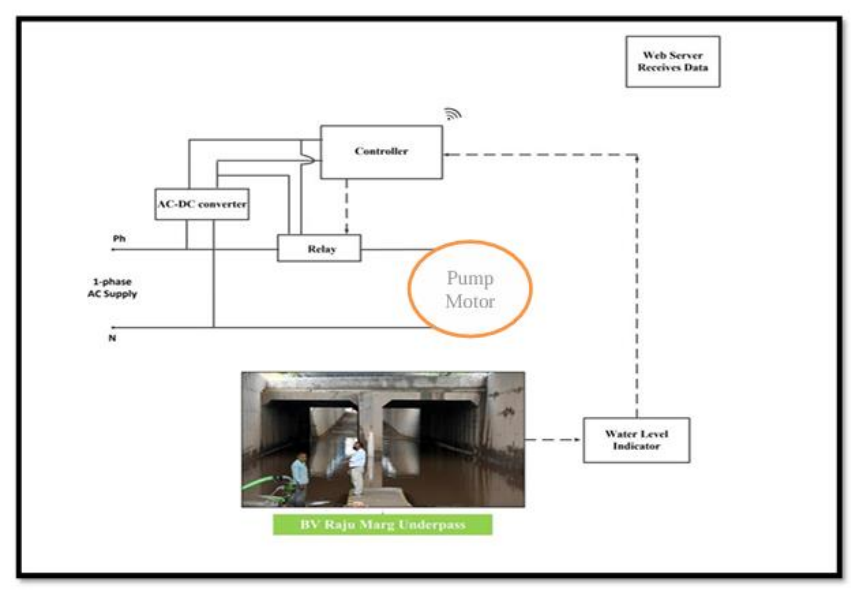

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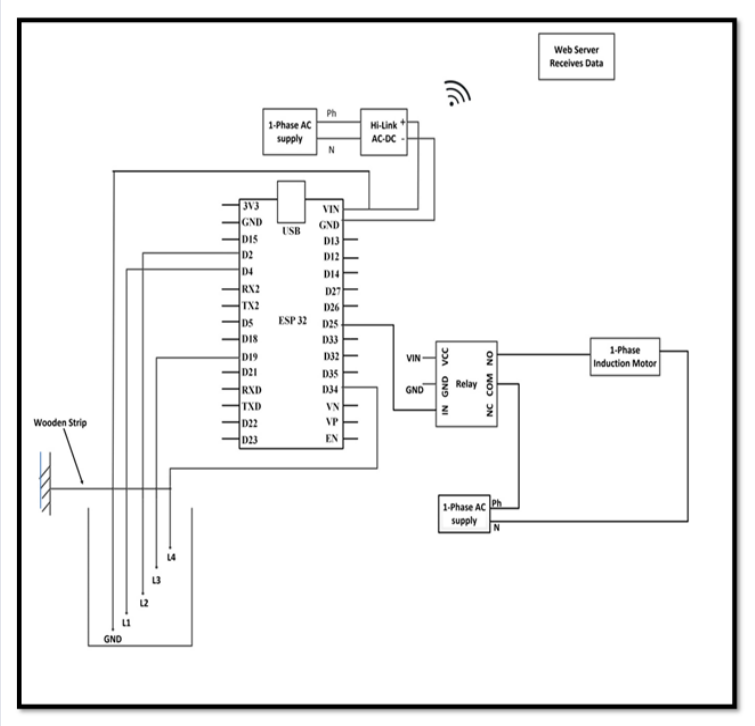

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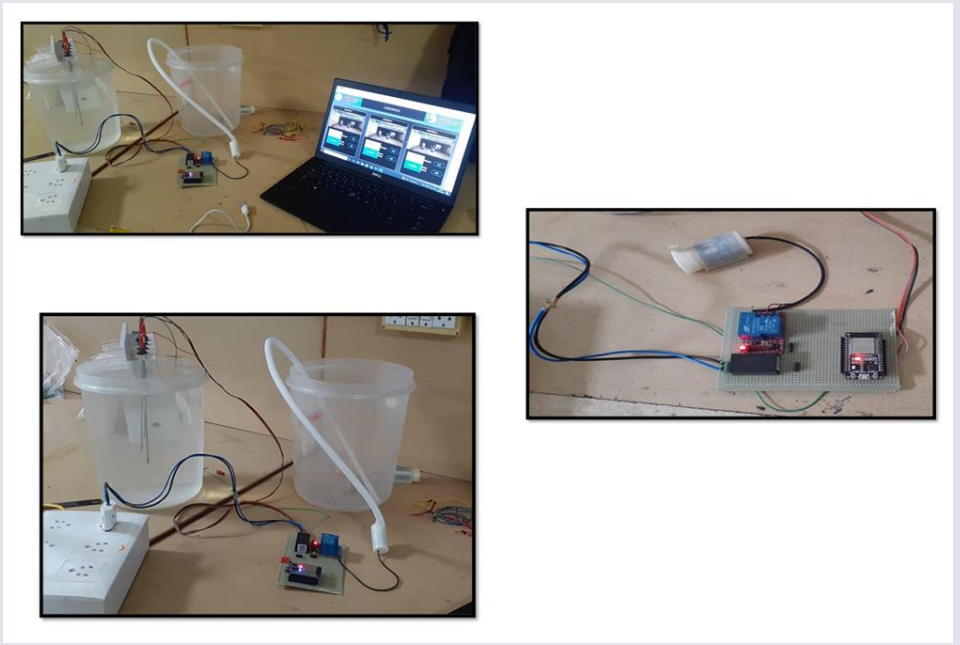

CONCLUSION:

In conclusion, an IOT-based autonomous water draining system for railway under bridges with real-time data monitoring can provide significant benefits to road under bridges and its infrastructure. The system can automatically detect and drain water from the under bridge area. An IOT based autonomous water draining system is developed for railway under bridges and it is tested in different conditions and areas in the zone. The designed device can clear water and send information to the designed dashboard. This proposed IOT system is developed by using an Arduino IDE and dashboard which is designed using HTML, CSS, React JS, Node Js, Mongo dB etc. Moreover, the real-time data monitoring feature can help the maintenance team to stay updated with the status of the drainage system and can alert them in case of any issues or faults. The dashboard is dynamic and updates the conditions continuously. The control is also able to switch on the motor according to the required conditions of stagnated water level. The performance of this device is satisfactory and accurate. Overall, the implementation of such a system can improve the efficiency and safety of clearing the stagnated water automatically while reducing the need for manual labor and other resources.

4. IOT- ENABLED DC PARAMETER MEASUREMENT SYSTEM

R. UDAY, V.SAI RAJ SRINIVAS, R. NARENDRA VARMA, S. REVANTH, V.SWAMY

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

OBJECTIVEOFTHEPROJECT:

The integration of IoT (Internet of Things) technology has revolutionized the measurement and monitoring of electrical parameters in laboratory settings. This project focuses on implementing IoT-based solutions for real-time measurement of electrical parameters in a DC (Direct Current) machines laboratory, with the objective of enhancing efficiency, accuracy, and accessibility. Traditional methods of measuring electrical parameters in laboratories often involve manual recording and monitoring, which are time-consuming and prone to errors. By leveraging IoT technology, this project automates measurements and enables remote monitoring, providing a more reliable and convenient solution. The proposed system employs sensors and data acquisition units to measure various electrical parameters such as voltage, current, power, and efficiency in DC machines. These measurements are wirelessly transmitted to a central server or cloud platform using IoT communication protocols like Wi-Fi or Ethernet. A web-based interface is developed to visualize the measured electrical parameters in real-time. This interface grants users access to the latest measurement data from any internet-connected device, facilitating remote monitoring and analysis. Additionally, historical data can be stored and analyzed to identify trends and potential issues in the DC machines. Implementing IoT-based solutions for electrical parameter measurement offers several advantages, including improved accuracy, reduced manual intervention, and enhanced accessibility. By presenting measurement values on a website, users can easily access real-time data, leading to better decision-making and laboratory process optimization. In summary, this project demonstrates the potential of IoT technology in modernizing laboratory environments and improving the efficiency of electrical parameter measurement in DC machines labs. Through automated measurement, wireless data transmission, and web-based visualization, it offers a comprehensive solution for real-time monitoring and analysis of electrical components.

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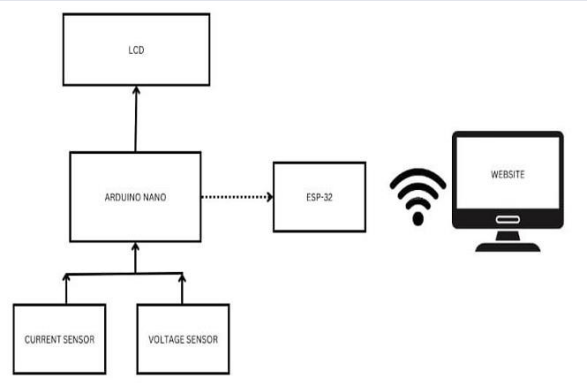

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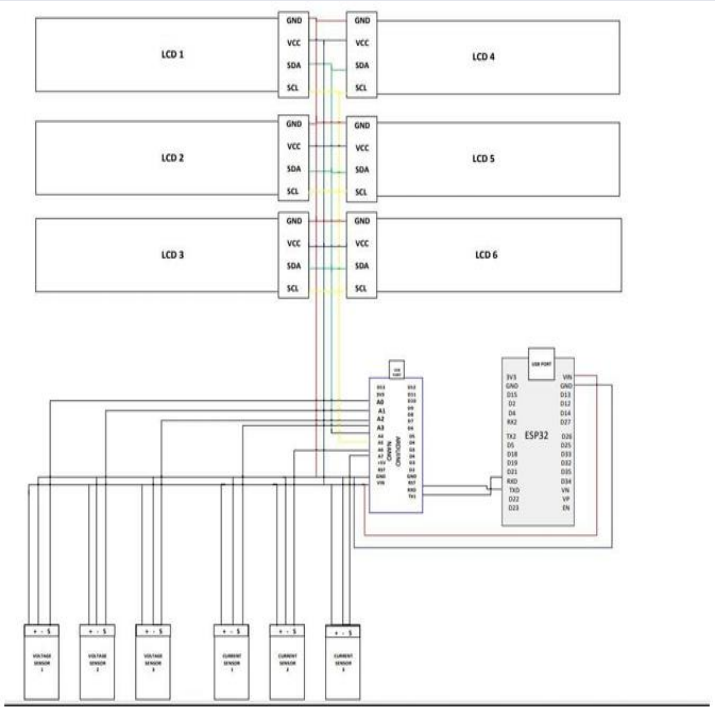


PMSM Simulation in MATLAB/Simulink:

CONCLUSION OF THE PROJECT:

The development of a IoT-Enabled DC Parameter Measurement System 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, power across a wide range of electrical systems, from small-scale circuits to large industrial installations. Its compatibility with different DC 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. Furthermore, the IoT-Enabled DC Parameter Measurement System enhances the efficiency and reliability of electrical testing and troubleshooting tasks. Its compact design and user-friendly interface facilitate ease of use, allowing technicians and engineers to quickly set up experiments and obtain accurate measurements. The integration of advanced features such as data logging and remote monitoring capabilities further enhances its utility in diverse settings, enabling real- time analysis and diagnostics. Overall, this innovative device represents a significant step forward in electrical measurement technology, empowering practitioners with the tools they need to tackle the complexities of modern electrical systems with confidence and efficiency.

5. IOT BASED LOAD CHARACTERIZATION OF 3-PHASE INDUCTION MOTORS: REAL-TIME DATA VISUALIZATION AND MONITORING

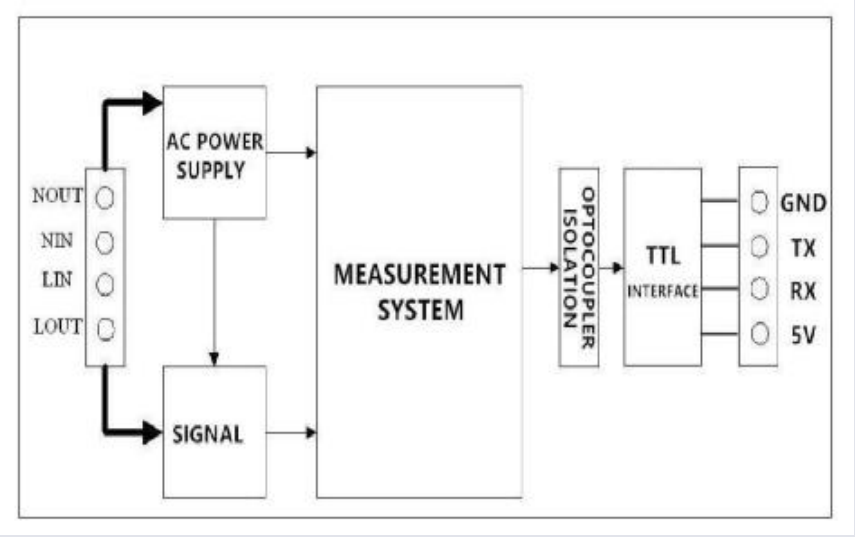
K.V.N.L.POOJITHA, K.RASWANTH, D.SURESH ROSHI, I.VIVEK, G.GOWRI SATISH

SUPERVISOR: Dr. V. S. N. NARASIMHA RAJU, M.Tech, Ph.D.

OBJECTIVEOFTHE PROJECT:

In today's modern era of education, traditional lab methods are becoming less relevant, necessitating the use of cutting-edge technologies to engage students. As a solution, we have developed an IoT system and dashboard to perform brake tests on 3-Phase Induction Motors, providing real-time data visualization and monitoring of crucial motor parameters such as current, voltage, frequency, power factor, active power, reactive power, and speed. Furthermore, this system generates load characteristic graphs in the desired format, including the student's name and registration number. The IoT system control was created using the Arduino IDE, while the dashboard was designed using a variety of technologies, including HTML, CSS, React JS, Node JS, and MongoDB.

Block Diagram:



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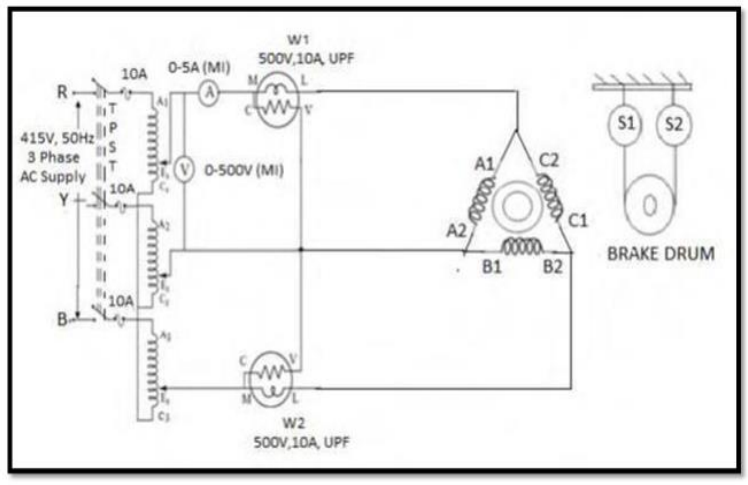

CONCLUSION:

In conclusion, the IoT-based system developed in this project provides an efficient and effective solution for monitoring and controlling 3-phase induction motors' crucial parameters in real-time. The system includes a sensor module to measure the motor parameters, an Arduino board to collect and process data, and a dashboard to display the data visualization. The system's dashboard provides an intuitive and user-friendly interface that allows the user to monitor the motor parameters, generate load characteristic graphs, and store the data for future analysis. The system's capability to provide real-time monitoring and visualization of motor parameters can help identify any issues with motor operation and take immediate corrective action, which can lead to improved efficiency, reduced energy consumption, and cost savings. The proposed system can be extended to various applications, including industries and power systems, where it can be used to monitor and control motor parameters in real-time, identify and address any issues with motor operation, and improve overall system efficiency. Overall, this project demonstrates the potential of IoT-based systems to revolutionize traditional laboratory methods and provide advanced monitoring and control solutions in various applications, leading to improved efficiency, reduced energy consumption, and cost savings.