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An Interacting Control and Monitoring of Multiple Strategy for Battery Based Electric Vehicle Model

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Abstract: We're taking a step in the right direction with our project. On-board diagnostics (OBD) is a simple self-diagnosing and reporting system for vehicles. OBD systems provide access to the status of a variety of automotive subsystems to the vehicle owner or repair technician. This project offered AI-based identification of hot spots on the surface of PV panels, insulator problems, power line inspections, and electric vehicles. This system uses a micro - controller embedded system with IoT connectivity for remote device monitoring. A web/PC based application can be used to monitor the proposed system.

Keywords: Ardunio,Proteus 7 Professional,NodeMCU,Ardunio NANO,Matlab

I.INTRODUCTION

Smart sensor interfaces have evolved through the Internet of Things (IoT) which acquires heterogeneous sensor signals and connects them to the Internet, providing intelligent services in various applications such as healthcare systems, automotive systems and EV monitoring systems. More specifically, healthcare systems have pursued the utilization of physiological and biomedical sensor data to improve the efficiency of health management of healthy subjects and patients Automotive systems have introduced new vehicular services to connect various sensors and GPS-based location information to communication networks. The EV manufacturing environment is also embedding new functions in the form of safety monitoring or smart factories. One recent trend of interest is the combination of heterogeneous systems and services from different fields such as by providing automated healthcare services in automotive environments

The automotive industry is heavily impacted by the need for ecologically friendly technology. Fuel consumption in conventional automobiles is a topic of global concern. As a result, the demand for ecologically friendly electric automobiles is growing. Electric vehicles are currently the subject of a lot of research. Specifically battery design and performance research. Its batteries must be able to run for a long time and have modest dimensions for electric scooter applications. To monitor battery performance, a compact and integrated battery pack should be created.

The Galvanic Isolation Concept has been used to discuss an integrated Battery Management System (BMS). A package management unit was included in the system, in addition to the battery module and module management unit. This is meant to provide a precise estimation of the battery's condition. Despite significant improvements in battery chemistry and material, battery systems are still usually oversized and underused, i.e., 20–50 percent excess energy capacity is offered, resulting in increased weight, volume, and purchasing cost. To reduce this conservatism, a battery management system that accurately senses essential internal variables such as state-of-charge (SOC), state-of-power, and state-of-health (SOH) is essential. Electrical characteristics of cells that can be connected must be similar. These drawbacks can indeed be resolved with the Battery Modular Multilevel management system

These limitation can be eliminated with the Battery Modular Multilevel Management System. A battery-based communication management system already exists between the master and slave boards in addition to this way. This method is now more effective in terms of programming code efficiency and is easier to develop. A reconfigurable battery pack has been built from the battery management system. This system has a larger capacity and is simple to adjust.

II.RELATED WORKS

Safety monitoring and automation systems have traditionally being designed to fulfil the needs of a specific monitoring application. The EV application has proceeded beyond the interconnection of a few major back-end systems, and an increasing amount of underlying physical devices are making the condition of objects and their surroundings effortlessly accessible to software systems. The majority of works, in fact, are built on monolithic system architectures, which are brittle and difficult to adapt.The persons who are working in the EV have to face various environmental parameters in their EV.

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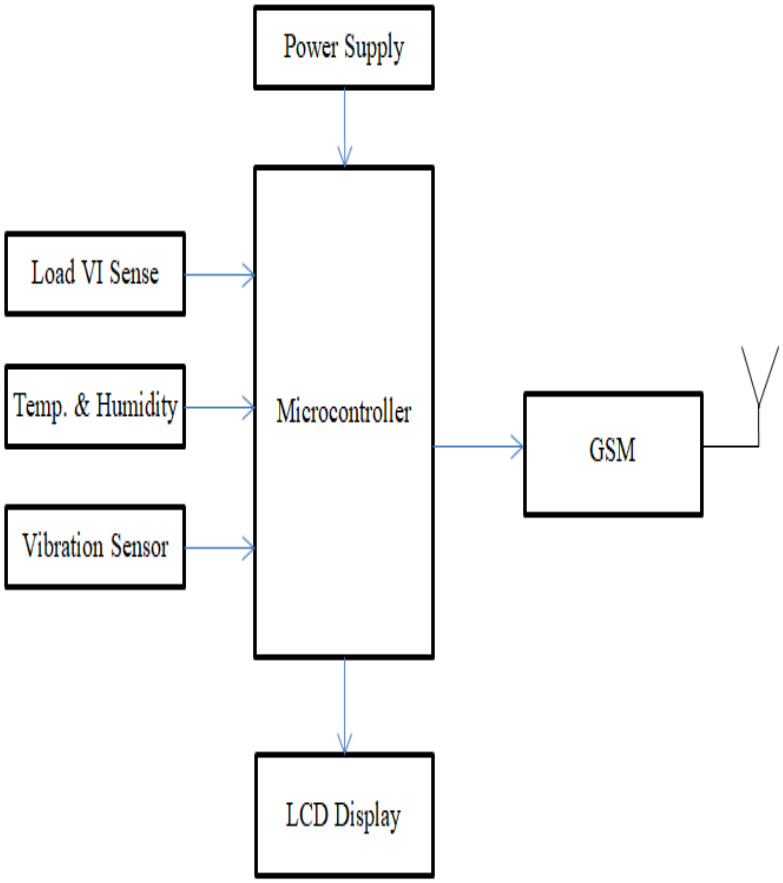

Existing block Diagram

So to overcome that problem we are using Zigbee based intelligent helmet for coal miners.EV incidents were unpredictable and it has many factors the event of an accident, not only causes huge economic losses, but a direct threat to the safety of miner.As an ICS is a cyber-physical system, the process of cybersecurity risk propagation in ICSs is different from that in general network systems.Most ICS attacks aim to vandalize ICS assets, which include humans, environment, and equipment.Traditionally, safety monitoring and automation systems were typically designed to meet the requirements of a single monitoring application.The application has already gone beyond the interconnection of a few large back-end systems.

III.PROPOSED SYSTEMS

Critical software and hardware systems for the control and monitoring of physical sensor field equipment are included in Information Technologies (IT) and Operational Technology (OT). For supply chain details like as logistics, assets, processes, and completion deadlines, IT and OT provide important, natural integration and visibility. This provides information to distanced control and management units, helping the ICS to remain efficient and competitive. However, cyber attackers frequently target IT and OT since most ICS lack strict security rules or the technology to detect and monitor cyberattacks.A graphical user interface (GUI) application that aids the interaction of hardware, control systems, and human operators is provided by the Human Machine Interface (HMI) (staff).From data and logs acquired from the ICS environment, the HMI displays trends, historical and real-time status. MI provides dashboards for measuring, configuring, establishing control points, and creating the operational parameters for the sensor and controller on a day-to-day basis.The Micro Controller (MC) is the ICS ad's control component for process management. MC gives devices such actuators and sensors monitoring, remote access, and control. Microprocessor-based field devices such as Remote Terminal Units (RTU) and Master Controller Units (MTU). The RTU receives directives from the MTU and relays data from the field.

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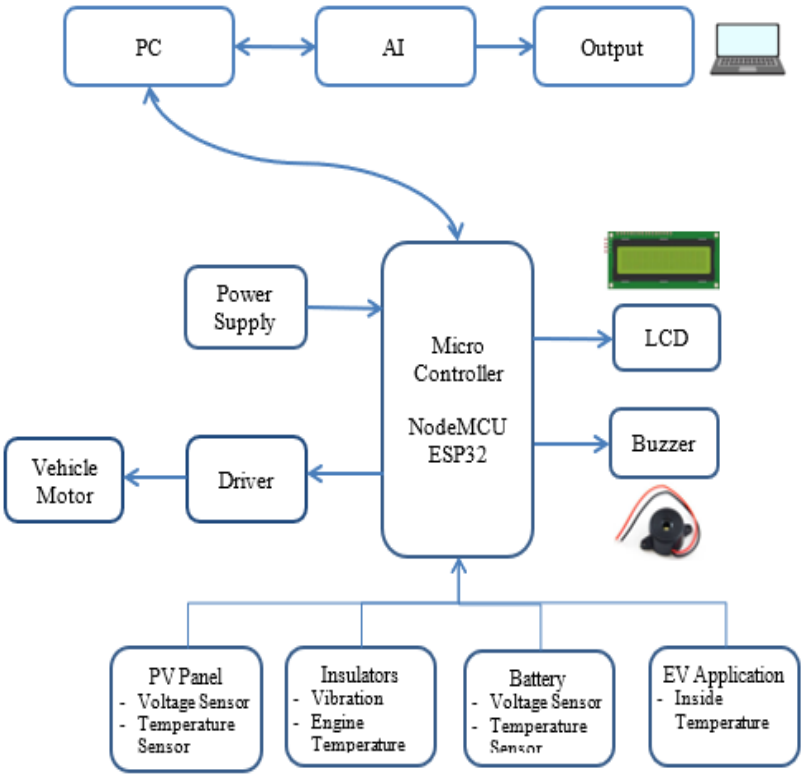

IV.RESULT AND DISCUSSION

Thing Speak, an online monitoring system, was used to track the proposed electric car formulation using IOT and EGBA. The outcomes tracked in Thing Speak are represented using MATLAB for offline analysis in order to preserve exact outcomes in day-to-day analysis. A real-time battery test was performed and analysed using four different scenarios to analyse real-time consequences and to introduce electric vehicles with IoT in industry. Thing Speak, an online monitoring system, was used to track the proposed electric car formulation utilising IOT and EGBA. The outcomes tracked in Thing Speak are represented using MATLAB for offline analysis in order to preserve accurate implications in day-to-day analysis. A real-time analysis of the implications and a real-time introduction of electric vehicles with IoT in industry

Thing Speak was chosen because it was perfectly applied to commercial projects that required a lot of MATLAB calculations. Users gained more benefit from the proposed method, and Think Speak performed much better than other services when it came to viewing the result offline.

In addition, the authors had multiple Math Works user identities and one authorized Think Speak unit. Because it was important to monitor the amount of charges passing through the vehicle, 33 million messages could be saved and information could be updated for periods of 15 seconds. If there were significant differences in charges over just a short period of time, state of charging information could not be retrieved.

As a result, the interval duration should be between 10–15 seconds, and it can be changed manually in each unit (even to 1 second) for licenced users. Angle sensors were employed in the proposed measurements using Arduino NANO to increase efficiency and reduce the cost of operation, hence decreasing energy consumption loss
Moreover, a HVAC (Heating Ventilation and Air Conditioning) actuator sensor was introduced for giving legitimate wind current to the whole framework and to accomplish low hysteresis misfortune. Moreover, for checking the whole control unit in the motor, vibration sensors were coordinated accordingly detecting the base and most extreme choke values. In Arduino NANO a battery was associated with one side of the voltage divider where a 9V battery was associated utilizing a sequential port at high baud rate.
In the proposed strategy clients ought to send order to each charging station for mentioning their vehicles to charge on the grounds that occasionally charging stations might be exceptionally blocked and there will a likelihood that clients can't get a period for charging. Moreover when clients are charging their vehicles they ought to have the option to control

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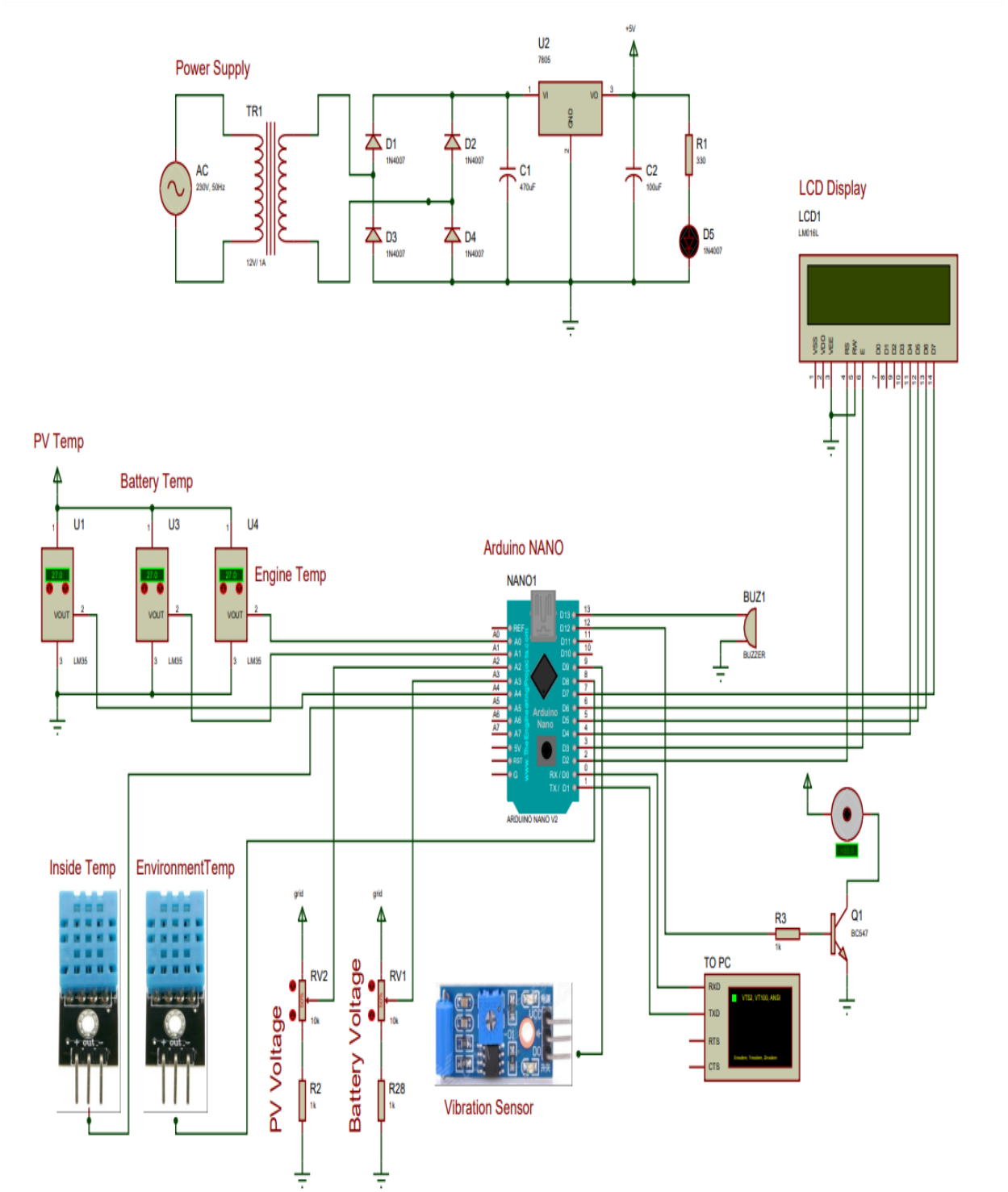
the charges inside a specific state. In this manner in these two pertinent cases there is a requirement for pilot signs to be produced at the collector side. Hence, a pilot sign will be created on demand and these pilot signs will be noticed utilizing a pilot signal screen which is coordinated with Arduino NANO, since in the equipment segment Arduino NANO is executed programming and constituents assume a fundamental part in charging electric vehicles basic to its activity. Additionally Arduino IDE will be utilized for programming the whole vehicle by incorporating the sensor parts. Hence, for better view of Arduino NANO, Thing Speak will be utilized for noticing the signs at collector.



This will allow all users to forecast the battery's capacity and distance from their remote locations, allowing them to extend the battery's life. A boosting (EGB) has been incorporated for faster monitoring and improved accuracy, and all

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values are shown in MATLAB in offline mode. Additionally, the location of the charging station as well as the number of vehicles charging in nearby stations can be displayed. Finally, due of the incorporated boosting algorithm, the data aggregation process will be much more successful, and all data will be processed correctly for all users.

V.CONCLUSION

EV Control Systems have developed from specific, air-gapped, controlled infrastructures to distributed, corporate systems that may be accessed via the Internet. ICS has been exposed to the open Internet, despite increased efficiency, speed, and precision quality. The battery pack monitoring system has previously been designed and tested. The action of balancing a cell aims to prevent harm to the battery pack due to voltage differences between cells. Because a variation in cell voltage might shorten the battery's life and lead it to fail quickly.

Along these lines, the proposed multi-sensor point of interaction can accomplish the smallness and the adaptability of the sensor module by using two reconfigurable techniques for different sensor interfaces and furthermore by moving the vast majority of the weights for signal adjustment and examination to a cell phone. DL approaches have been broadly utilized in different applications. Be that as it may, in this venture, major electrical applications have been considered for audit. DL has demonstrated to have remarkable purposes in various fields. The essential cutting edge structures have been examined, and we have gotten an equipment model and MATLAB GUI investigation of them. An endeavor to advance a condition of craftsmanship EV Vehicle shortcoming finding has been made.

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