IJAREEIE

e-ISSN: 2278-8875
p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 10, Issue 3, March 2021

INTERNATIONAL STANDARD SERIAL NUMBER INDIA

Impact Factor: 7.122

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|

||Volume 10, Issue 3, March 2021||

DOI:10.15662/IJAREEIE.2021.1003010

E-Software for Electric Vehicles Using LabVIEW

A.G.Ahamed Zuhoor[1], R.Akashsami[2], V.Sivasubramanian[3], M.TharikAhamadu Mohamed Dheen.M[4]

UG Student, Dept. of ICE, Saranathan College of Engineering, Trichy, Tamilnadu, India[1]

UG Student, Dept. of ICE, Saranathan College of Engineering, Trichy, Tamilnadu, India[2]

UG Student, Dept. of ICE, Saranathan College of Engineering, Trichy, Tamilnadu, India[3]

UG Student, Dept. of ICE, Saranathan College of Engineering, Trichy, Tamilnadu, India[4]

ABSTRACT: This project is based on e vehicleswhich is named as E-tron, enables the user for more reliable, efficient E vehicle with smarter operations for the Electric Vehicle user. This software helps us to identify the flaws and rectify the issues to predict the Maintenance of our vehicle. It is also embedded with different modules such as Battery Life Analyser, Charge Predictor, Battery Optimization and SOS operations within this software. The software has a rich User Interface which performs smart and efficient operations. It has the capability to communicate directly to the company about the vehicle status. It has a novelistic feature of automatic navigation and re-routing based on the designed algorithm. When there is a viability of increasing the Electric Vehicles, this product would be an added advantage which is packed with features conducive to Electric Vehicles. This would ultimately make for the faster adoption of Electric Vehicles in any country.

KEYWORDS: Battery Usage, Battery life prediction, Charging stations by GPS, Vehicle to vehicle communication.

I.INTRODUCTION

Our E-Tron is indigenously developed software which enables smarter operations for the Electric Vehicle user.
This software helps us to identify the flaws and rectify the issues to predict the Maintenance of our vehicle. It is also embedded with different modules such as Battery Life Analyser, Charge Predictor, Battery Optimization and SOS operations within this software.The software has a rich User Interface which performs smart and efficient operations. It has the capability to communicate directly to the company about the vehicle status.It has a novelistic feature of automatic navigation and re-routing based on the designed algorithm. When the E-Tron software is deployed, it would be ready to use in any vehicle as the software is universal. The reliability, efficiency and smarter operations are getting assessed at low cost.When there is a viability of increasing the Electric Vehicles, this product would be an added advantage which is packed with features conducive to Electric Vehicles. This would ultimately make for the faster adoption of Electric Vehicles in any country

.

II.SYSTEM MODEL AND ASSUMPTIONS

The main objective of the project entitled"E-TRON" is to increase the reliability, efficiency and to make smarter operations for E-vehicles all integrated into one software.In existing system there is provision only for indicating Battery Charge Level, Speedometer, Odometer only but it lacks the potential to breakthrough into consumers mind to make EV into a formidable force in automotive industry.Ourproposed system was designed and developed in LabVIEW platform in a sure way to ensure various functions and operations are automated as a single software for user.

- Predictive Maintenance
- Battery Life Analyser
- Charge Analyser
- Battery Saver
- Emergency Actions

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|

||Volume 10, Issue 3, March 2021||

DOI:10.15662/IJAREEIE.2021.1003010

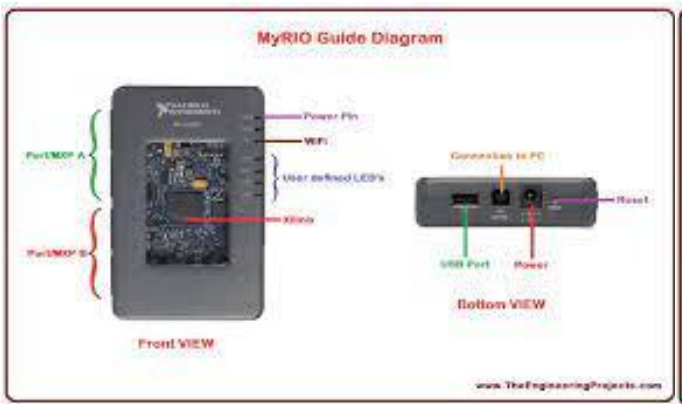
III.HARDWARE AND SOFTWARE DESCRIPTION

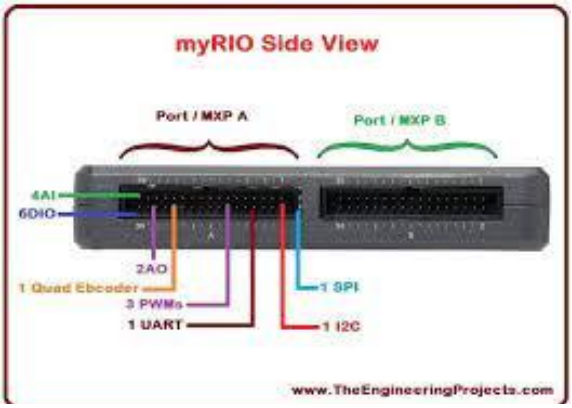
Software: LabVIEW-2017. LabVIEW- Laboratory Virtual Instrument Work Bench. We were used LabVIEW-2017 for our simulation. It offers a Graphical programming approach that helps you to visualize every aspect of your application, including Hardware configuration, measurement of Data, and debugging. This visualization makes it simple to integrate measurement hardware from any vendor, represent complex logic on the diagram, develop data analysis algorithms, and design custom engineering user interfaces. In particularly we are using LabVIEW Database Toolkit.

LabVIEW Database toolkit: It is used to communicate and pass data between LabVIEW and either a local or a remote Database management systems (DBMS).

GPS API: It returns a location and accuracy radius based on information about cell towers and WiFi nodes that themobile client can detect.

Hardware:myRIO.myRio provides educators with an embedded, WiFi-enabled solution to deliver an engaging approach to learning controls, investigating mechatronics, and designing imaginative capstone projects. Device features I/O on both sides of the device in the form of MXP and MSP connectors. It includes analog inputs, analog outputs, digital I/O lines, LEDs, a push button, an onboard accelerometer.





| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|

||Volume 10, Issue 3, March 2021||

DOI:10.15662/IJAREEIE.2021.1003010

IV. FEATURES

E-TRONis our Indigenously developed software on LabVIEW platform. It enables the user for more reliable,efficient E-vehicle with smarter functions. It enhances the usage and gives clear view about the E-vehicle's Battery charge distribution. The main features are,

PREDICTIVE MAINTENANCE: The main thing we have to consider while using normal vehicle or E-vehicle is maintenance. This is the Key factor which leads to the longevity of the vehicle usage. In particularly for using E-vehicles there is most commonly faced drawback among people is Maintenance. So we are majorly focused to solve this drawback. We used protocols to Real-time monitoring of vehicles and indicate when the maintenance is required. The main protocol that is being used here is I2C communication protocol, I2C combines the best features of SPI and UARTs. With I2C, we can connect multiple slaves to a single master (like SPI) and we can have multiple masters controlling single, or multiple slaves. This is really useful when we want to have more than one sensors logging data to a single memory card. For example, here we have used to monitor the fluid levels of both brake and battery coolant with the use of level sensors which indicates the current level of the fluid and when it decreases, the overall maintenance action of the vehicle changes to compulsory. This also applies to the case of wheel alignment, where an accelerometer is being placed on alloy of the wheels and when any one of the wheel is not properly aligned which is set to certain level, the overall maintenance action indicates as the vehicle compulsorily has to go under maintenance.

BATTERY LIFE ANALYZER: In Battery life predictor battery conditions are all monitored and given to an mathematical algorithm to predict our Battery life condition and its future life. Life of a battery in an e-vehicle plays an important role in electric vehicle market. So we have developed this prediction methodology based on several actions done by the user and the battery itself, it depends mainly on the efficiency and temperature loss whenever the vehicle is in use. For this a temperature sensor with I2C or UART protocol is being connected with the battery for analysing the current temperature status instantly. Secondly, every e-vehicle's battery starts to reduce its efficiency after reaching a particular range so the battery level starts to reduce more quickly this indicates that life of the battery has been reduced, it also depends on how much time the battery has been charged this is called as charging cycle so based on these criteria battery condition are displayed whether it is good, moderate or poor.

REAL TIME CHARGE ANALYZER: Calculates the loads of the battery while E-vehicle is in operation and in the steady state to calculate the load demand and predict.Display the current and predictive charge in the battery(Percentage, Timer). When the e-vehicle is switched ON, the analysis of the current charge capacity is being noted through loads of the battery used, the capacity of the battery depends on the usage of the user whether they use air conditioner or other auxiliary systems like music system, lightings etc. Based on these conditions the system starts to predict the battery andcharging range in real time.

BATTERY SAVER: Itwill be activated after an "X"-level of battery range, it will reduce the battery loads by optimizing battery discharge in vehicle like switching OFF A/C and auxiliary systems. E-TRONalso automatically Re-routesthe vehicle to the nearest charging stationdepending on charge level and algorithm.
EMERGENCY:If no charging station is available an SOS signal message with the location tagged will be sent to the nearest E-vehicle or the nearest station for Help. Here we are using the button which is already present in myRIO, when the user presses it, the location and message of the user is being sent to nearest e-vehicle or stations that are present active at that moment.

ACKNOWLEDGEMENT: Itwill be received when other user accepts, with their location. This is experimentally done through LCD connected in several channels which uses master/slave protocol, this is a model of asymmetric communication or control where one device or process controls one or more other devices or processes and serves as their communication hub. In some systems, a master is selected from a group of eligible devices, with the other devices acting in the role of slaves. Hence the location and message of that e-vehicle user is being received,viewed and acknowledged by anyone who is online and ready to help.

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|

||Volume 10, Issue 3, March 2021||

DOI:10.15662/IJAREEIE.2021.1003010

V. FLOW OF CODE

Fig 1, This flow diagram shows how these features are interpreted using LabVIEW program.

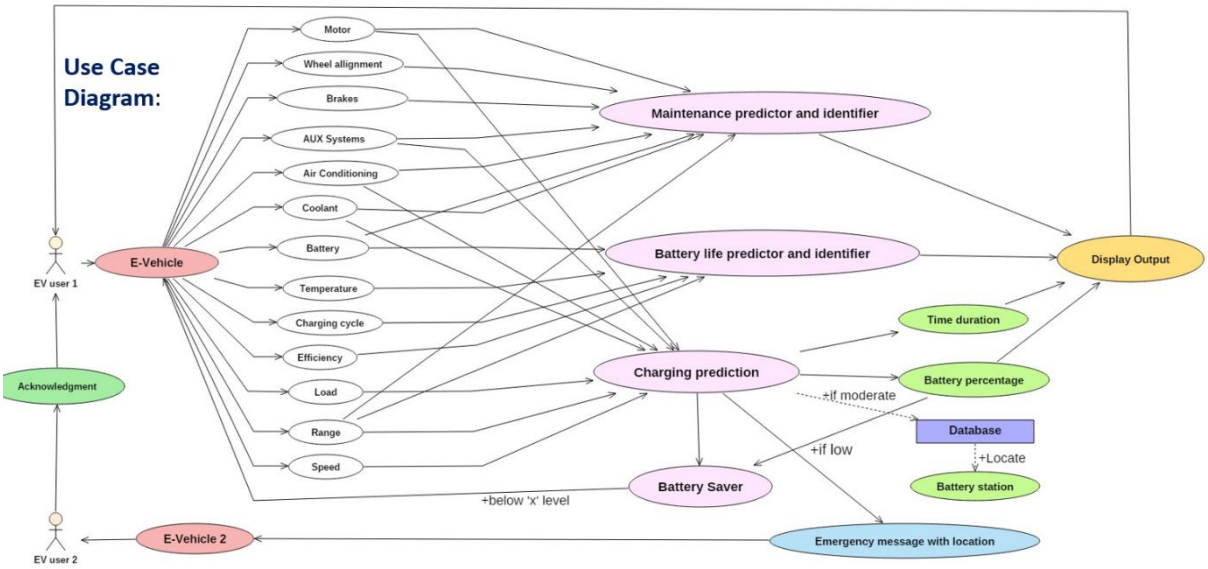


Fig. 1 Flow of code.

VI. RESULT

In the fig 2,it shows various features like charge life prediction, Battery life , Battery action, Maintenance and emergency response. This is our simulated front Panel of our vi.

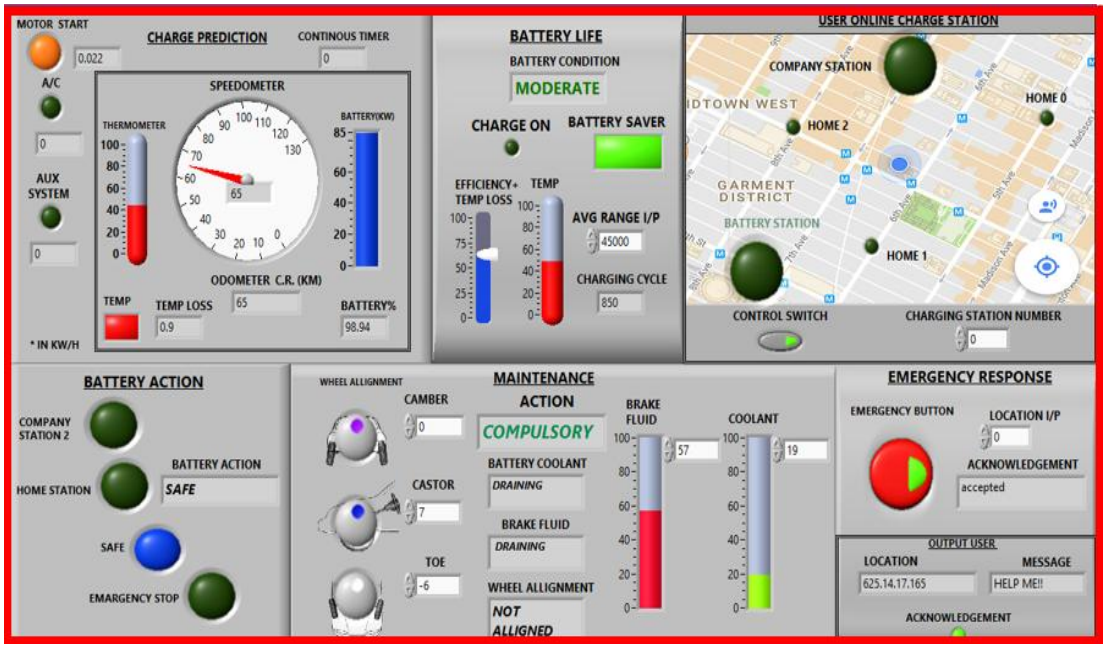


Fig. 2 Final simulated Features Front Panel.

| e-ISSN: 2278 – 8875, p-ISSN: 2320 – 3765| www.ijareeie.com | Impact Factor: 7.122|

||Volume 10, Issue 3, March 2021||

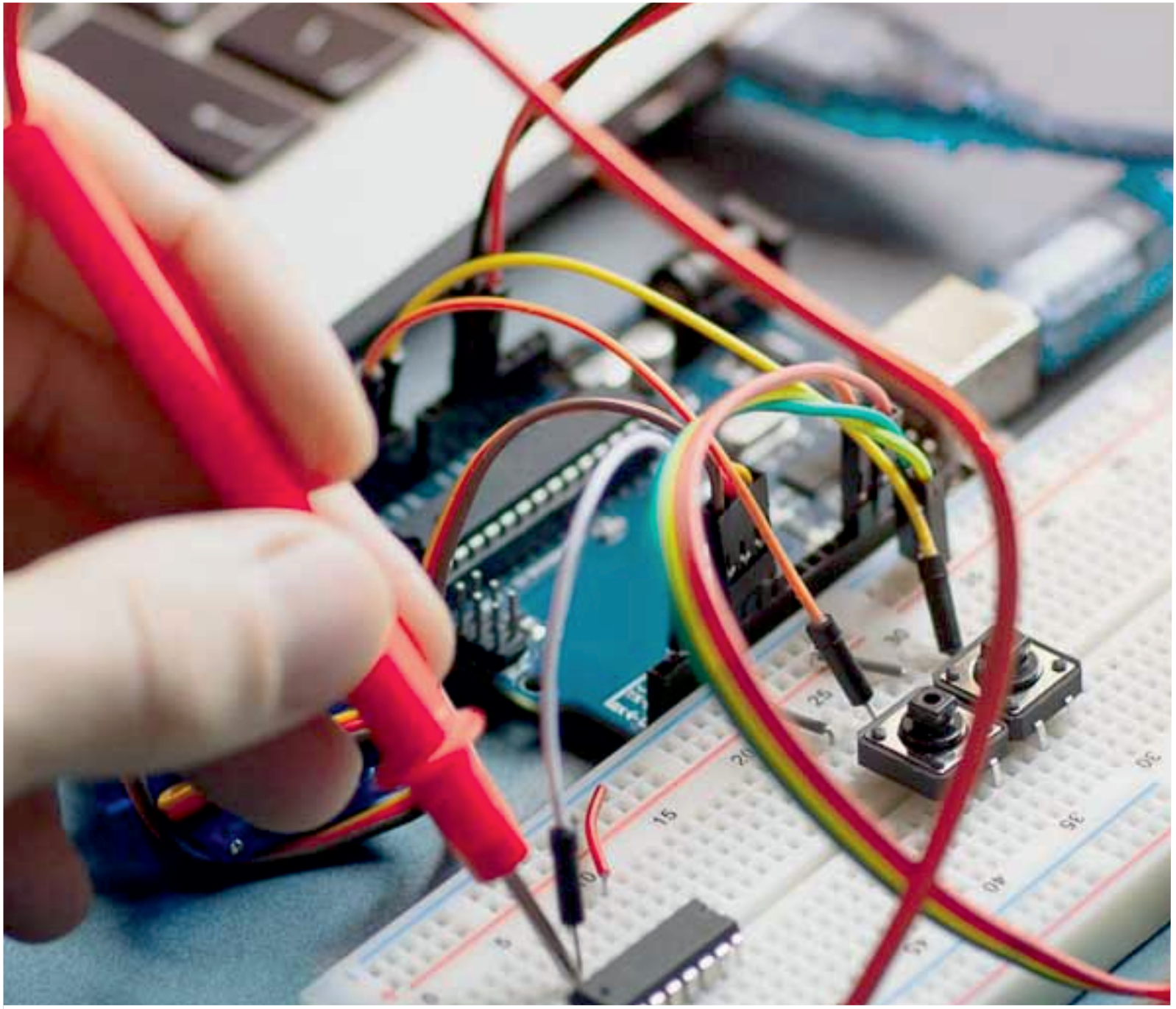
DOI:10.15662/IJAREEIE.2021.1003010

VII. CONCLUSION

Through our software product we are concluding the usage of battery in E – vehicles is maintained and to make an add on we also provide the details of vehicle maintenance and we provide interface between the users by which they can help each other when the battery runs down. This is an user friendly interface, so any age of user can easily access our product. In future it can be implemented with minor changes according to the developing company's criteria and they can install easily. This provides the interface between user and company, so that the problem can be sorted out.

REFERENCES

[1] **www.NI.com**
[2] **https://www.ni.com/en-in/shop/engineering-education/portable-student-devices/myrio-student-embedded-device/what-is-myrio.html**
[3] **https://learn.ni.com/teach/resources/filter?catids%5B%5D=81&filter_ids%5B%5D=16&perpage=10**
[4] https://www.researchgate.net/publication/323967720_EMobility_smart_grid_and_charging_session_of_electric_vehicles.
[5] U. Abronzini et al., "Optimal energy control for smart charging infrastructures with ESS and REG," 2016 International Conference on Electrical Systems for Aircraft, Railway, Ship Propulsion and Road Vehicles & International Transportation Electrification Conference (ESARS-ITEC), Toulouse, 2016, pp. 1-6.
[6] L. Secco, A. Alberti, E.L. Secco, MOB-Y: Smart Grid for sustainable MOBility with retrofit Electric Vehicles, The 3rd IEEE International Conference on Cybernetics (CYBCONF2017), 21-23 June 2017, DOI: 10.1109/CYBConf.2017.7985790.



INNO SPACE
SJIF Scientific Journal Impact Factor

Impact Factor:
7.122

ISSN INTERNATIONAL STANDARD SERIAL NUMBER INDIA

निस्केयर NISCAIR

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

9940 572 462 6381 907 438 ijareeie@gmail.com

www.ijareeie.com

Scan to save the contact details