

EV CHARGING STATION WITH COIN BASED PAYMENT SYSTEM

PROF. D. R. PISAL.

KUNAL MULEKAR, AKTHAR SHAIKH, SANKET GAIKWAD, SIDDHESHWAR DATE

DEPARTMENT OF ELECTRICAL ENGINEERING, TSSM'S BSCOER, NARHE, PUNE

ABSTRACT:

The transportation sector of the world is in the transformation stage, shifting from conventional fossil fuel-powered vehicles to zero or ultra-low tailpipe emission vehicles. To support this transformation, a proper charging station (CS) infrastructure in combination with information technology, smart distributed energy generating units, and favorable government policies are required. The motive of this Project is to address the key aspects to be taken care of while planning for the charging station infrastructure for electric vehicles. The Project also provides major indignation and developments in planning and technological aspects that are going on for the enhancement of the design and efficient management of charging station infrastructure. The Project addresses the present scenario of India related to electric vehicle charging station developments. The Project specially provides a critical review on the research and developments in the charging station infrastructure, the problems associated with it, and the efforts that are going on for its standardization to help the researchers address the problems. Keywords: electric vehicle; charging station; EV charging Station; smart charging; charging infrastructure etc.

INTRODUCTION

The use of electric vehicles plays an important role in improving the traffic and helps in maintaining a healthier living environment by zero or ultra-low tailpipe emissions and much lower noise. The development of an electric vehicle charging station and its optimal location is very important for easier adoption of electrically propelled vehicles and the use of

cheap and clean electrical energy from grid and renewable energy resources. A proper charging station network will help in alleviating the range anxiety of owners of electric vehicles (EVs), assuring the similar performance of EVs compared to that of the internal combustion engine vehicles. To lay more emphasis on continuous improvement in recharging technology, the share of electric vehicles in the market must be increased. The present problem with the adoption of EVs can be related to the "chicken or egg" theory. The consumers are waiting for proper charging infrastructure to get full assurance of successful

MOTIVATION

The main motivation behind this Project is the sustainability we need to implement in our day to day lives. There is a very serious problem of global warming due to excessive use of fuels like Petrol and Diesel. Also, the demand for EV is rising day by day because of various such issues. Our proposed Project will serve the society in particular ways.

Also, using of EV Car can considerably prove economical as compared to rising cost of fuels.

Hence, we are motivated to design and develop and Electric Vehicle charging station with certain features as mentioned above.

LITERATURE REVIEW: Development of Electric Vehicle Charging Station Management System in Urban Areas Prasetyo Aji; Dionysius Aldion Renata; Adisa Larasati; Riz 2020 Application development is used to make a tool in the form of a CSMS application to monitor and control CS with the name SONIK (electric vehicle charging operation system) Concept of charging stations for electric cars Oliver Marcincin; Zdenek Medvec 2014 This paper is about active charging stations for electric cars. Active charging station is

usually part of modern electrical grids, known as a Smart Grids or Micro Grids. This paper also includes an executive summary existing knowledge about the structure and service of electricity distribution network, analysis of electric car industry and its potential impact on the electrical network and also conceptual solution charging stations electric cars with minimal effects on the power network. Solar based electric vehicle charging station Md Sohail Tanveer; Sunil Gupta; Rahul Rai; Neeraj Kumar Jha; Mohit Bansal 2019 This paper investigates the possibility of charging the battery of electric vehicles at a various working place like offices, colleges, hospitals, universities etc in Delhi, India using solar energy.

A. Transformer (T1)—Main Power.

Look at load: 24V 25W light bulbs. They use

current are... $P/V = I$, $P = 25W$; $V = 24V$
 So, $I = 25/24 = 1.04A$.

You may use a 1A transformer. But in a long time, it is hot.

We should it is at least 1.5 times of load current. Or 1.5A in this case. But we cannot find a 1.5A transformer. So, use of 2A is better.

Then, How much voltages of the transformer (ACV)?

As Principle of unregulated power supply DCV is 1.414 times of ACV.

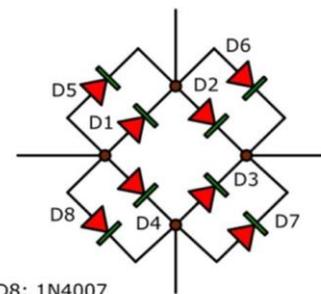
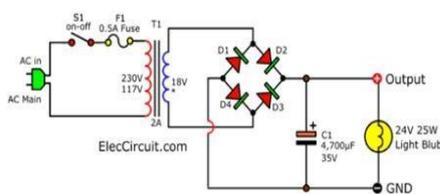
When 24V light bulbs. $ACV = 24V/1.414 = 16.9V$

We may use the 18V transformer. If no load the voltage is about 26V. And In load voltage may be lower 22V. But it can keep light stable. So, we should 18V 2A secondary transformer.

III. TECHNOLOGY USED

1) *Programming Software-Arduino IDE:* The Arduino Integrated Development Environment is a cross-platform application that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards programming paradigms, including procedural, object-oriented, and functional programming.

IV. IMPLEMENTATION

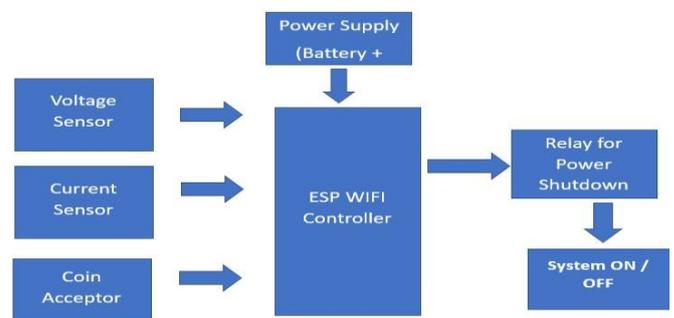


D1 to D8: 1N4007

ElecCircuit.com

Connecting diodes in parallel to increase current

In this section, we will include all the technicalities of the Project including block diagram, Proposed System, Specifications, selections etc.

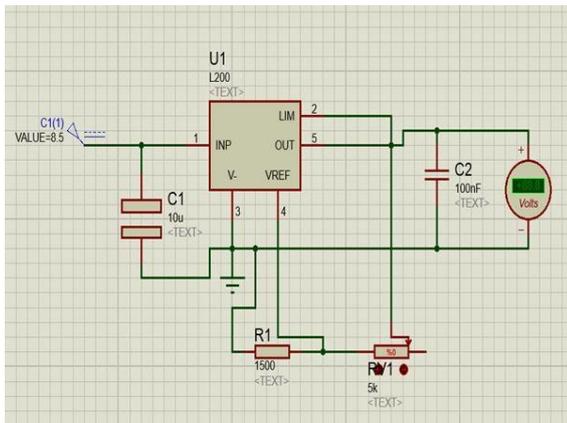


V. SIMULATION AND TESTING

A. Proteus Simulation for Variable Power Supply Design-

As rest of the sensor and Module Libraries are not supported in the Proteus Basic Version, we are

implementing only Power Supply Simulation and its screenshot



VI. OTHER SPECIFICATION

A. ADVANTAGES

- 1) No Human required for this Operation
- 2) Large profits can be made by Owner
- 3) Simple and efficient
- 4) Compact Design

B. DISADVANTAGES

- 1) No Human required for this Operation
- 2) Large profits can be made by Owner
- 3) Simple and efficient
- 4) Compact Design

VII. CONCLUSION

- 1) Thus, we have studied, Simulated and tested the Project concepts using Simulation Software like Proteus and IoT App. like Blynk.
- 2) We also Implemented the IoT Concepts like Live data monitoring of the Project parameters like Voltage and current monitoring.
- 3) As the result, we came to a conclusion that this Project has all the Capacity to serve the Society in a better way by providing the Autonomous EV Charger System that runs on AC supply and converts

the charge to DC to Charge the Batteries of Level 1 or Level 2.

- 4) We also can say that Coin acceptor can solve the problem of manual collection of cash which is not transparent in many public places.
- 5) Also, Solar panel can be used to power on the Embedded Circuit which is an additional Benefit to the system. The conclusion of this project is that we can use ESP Controller to control the System without Human Interference and can even monitor the System on Mobile App.
- 6) The Power supply can be made variable so that it can charge a range of 24V to 48V Batteries 7) The parameters like Voltage, Current can be monitored and displayed on the Screen.

Various Functions can be added to make the system more advanced and reliance for commercial use.

VIII. ACKNOWLEDGMENT

Firstly, we would like to express our sincere gratitude to our project supervisor Prof. Mr. R.M. Sahu continuous support of this project and his patient guidance, enthusiastic encouragement and useful critiques, motivation, and immense knowledge. We would like to thank the rest of our thesis committee, Prof. R.M. Sahu for their guidance helped, insightful comments and encouragement, also for the hard question which incited me to widen my research from various perspectives. Our sincere thanks also go to all the staff members of the department for the valuable information provided by them in their respective fields. We are grateful for their cooperation during the period of our project.

REFERENCES

[1] Hiwatari, Ryoji, Tomohiko Ikeya, and Kunihiro Okano. "A road traffic simulator to analyze layout and effectiveness of rapid charging infrastructure for electric vehicle." In 2011 IEEE Vehicle Power and Propulsion Conference, pp. 1-6. IEEE, 2011.

[2] Gong, D., M. Tang, S. Liu, G. Xue, and L. Wang. "Achieving sustainable transport through resource scheduling: A case study

for electric vehicle charging stations." *Advances in Production Engineering Management* 14, no. 1 (2019).

- [3] Shepero, Mahmoud, and Joakim Munkhammar. "Spatial Markov chain model for electric vehicle charging in cities using geographical information system (GIS) data." *Applied energy* 231 (2018): 1089-1099.
- [4] Guo, Chunlin, Jingjing Yang, and Lin Yang. "Planning of electric vehicle charging infrastructure for urban areas with tight land supply." *Energies* 11, no. 9 (2018): 2314.
- [5] Ma, Chao-Tsung. "System planning of grid-connected electric vehicle charging stations and key technologies: A review." *Energies* 12, no. 21