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Ongoing Charging System for Heavy Transport Vehicles

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ABSTRACT: In this work is proposed the design of a charging system to create ease and handle Electric Vehicles (EV) charging procedures, based on effective charging process using pantograph. Due to the electrical power distribution network limitation and absence of smart meter devices, Electric Vehicles charging should be performed in a balanced way, taking into account past experience, weather information based on data mining, and simulation approaches. In order to allow information exchange and to help user mobility.

KEYWORDS: Electrical vehicle, Pantograph

I. INTRODUCTION

Electric vehicle supply equipment (EVSE) is the basic unit of EV charging infrastructure. The EVSE accesses power from the local electricity supply and utilizes a control system and wired connection to safely charge EVs. An EVSE control system enables various functions such as user authentication, authorization for charging, information recording and exchange for network management, and data privacy and security. It is recommended to use EVSEs with at least basic control and management functions, for all charging purposes. Conductive charging, or plug-in (wired) charging, is the mainstream charging technology in use. Requirements of EVSE for conductive charging depend on factors such as vehicle type, battery capacity, charging methods, and power ratings.

II. REQUIRED COMPONENT

1. Microcontroller IC

The ATmega328 is a single-chip microcontroller created by Atmel in the megaAVR family (later Microchip Technology acquired Atmel in 2016). It has a modified Harvard architecture 8-bit RISC processor core.

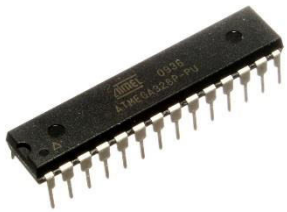

Fig 1.Microcontroller IC

2. Bluetooth Module HC-05

HC-05 is a Bluetooth module which is designed for wireless communication. This module can be used in a master or slave configuration.It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard, and many more consumer applications. It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions.

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Fig2. Bluetooth Module HC-05

3. Motor Driver

This L298N Motor Driver Module is a high power motor driver module for driving DC and Stepper Motors. This module consists of an L298 motor driver IC and a 78M05 5V regulator. L298N Module can control up to 4 DC motors, or 2 DC motors with directional and speed control .

Fig 3. Motor Driver

4. Voltage Regulator

Voltage sources in a circuit may have fluctuations resulting in not providing fixed voltage outputs. A voltage regulator IC maintains the output voltage at a constant value. 7805 Voltage Regulator, a member of the 78xx series of fixed linear voltage regulators used to maintain such fluctuations, is a popular voltage regulator integrated circuit (IC). The xx in 78xx indicates the output voltage it provides. 7805 IC provides +5 volts regulated power supply with provisions to add a heat sink.

Fig4.Voltage Regulator

5. DC motor

A direct current (DC) motor is a type of electric machine that converts electrical energy into mechanical energy DC motors take electrical power through direct current, and convert this energy into mechanical rotation.

Fig5.DC Motor

6. Servo motor

A servo motor is a type of motor that can rotate with great precision. Normally this type of motor consists of a control circuit that provides feedback on the current position of the motor shaft, this feedback allows the servo motors to rotate

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with great precision If you want to rotate an object at some specific angles or distance, then you use a servo motorIt is just made up of a simple motor which runs through a servo mechanism.

Fig6.Servo Motor

III. BLOCK DIAGRAM

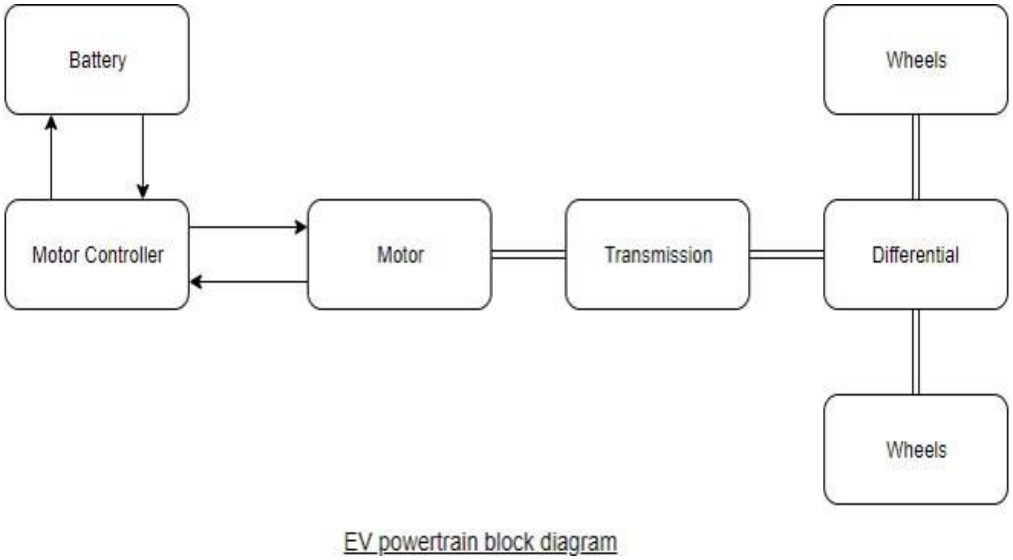

Fig 5. Block diagram of proposed system

IV. WORKING

An electric vehicle is a vehicle which is powered by electricity which is stored in batteries placed in vehicle. These batteries needs to charge as they get discharge while running but the time taken to recharge these batteries is much more. We lodged 2 power lines in the divider of the roads on the highway one consists line and another is grounded. The 2 parallel shaft (pantograph) in the vehicle operated by Arduino with the help on switch controlled by and driver of the vehicle using servo motor As switch is pressed the shafts gets opened as soon as vehicle move towards divider the shafts gets attached in between the line and ground of the divider. As as shaft (pantograph) gets attached with line and ground alternate current passes through the battery charging circuit. The charging circuit charger the battery while vehicle moving towards destination.

V. CONCLUSION

We are able to run heavy transport vehicles for longer distance with the help of ongoing charging system which charges the EV while running on the highways

VI. FUTURE SCOPE

The transition to electric mobility is a promising global strategy for decarbonizing the transport sector. India is among a handful of countries that support the global EV30@30 campaign, which targets to have at least 30% new vehicle sales be electric by 2030. An accessible and robust network of electric vehicle (EV) charging infrastructure is an essential

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pre-requisite to achieving this ambitious transition. The Government of India has instituted various enabling policies to promote the development of the charging infrastructure network. However, given the novel characteristics of this new infrastructure type, there is a need to customize it to the unique Indian transport ecosystem and build capacity among stakeholders to support its on-ground expansion. A contextual approach is needed to ensure the efficient and timely implementation of EV charging infrastructure, such that it meets local requirements and is optimally integrated within the electricity supply and transportation networks.

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