

## Eco Friendly Bus

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**Abstract** -The aim of this research is to examine the mechanism and performance of Bus Rapid Transit (BRT) system and its impacts on environment quality. Nowadays conventional buses which run on fuel results in release of the harmful gases such as CO<sub>2</sub> which leads to increase in environment pollution ,global warming, this also affect the health of human being, along with these fuels which is used in buses is non-renewable source of energy and goes on decreasing day by day. In order to control the situation we are proposing a method in which instead of using a fuel in buses we are developing a electric bus. This bus is eco-friendly and uses renewable source of energy. Electric vehicles offer superior energy efficiency while offering an massive Potential for reducing CO<sub>2</sub> emissions if the electricity is supplied from a renewable or nuclear source. However, they are presently neither range- nor cost-competitive compared to conventional vehicles, due to limited options for recharging, and expensive energy storage (batteries). This system aims at extending the wireless power transfer to the charging of moving electric vehicles. As a optional part we are using a solar panel if in case bus get not fully charge through the circuitry. Along with this the BRT bus indication unit i.e. signalling system and verification system is also provided to verify the BRT bus and to indicate the status of the bus.

**Key words:** Electric Bus, Wireless Charging System E-Bus, Inductive Coupled Charging

### 1. INTRODUCTION

To boost eco-friendly vehicles sales, the government today launched FAME India scheme that envisages to provide Rs 795 crore support till 2020 for the manufacturing and sale of electric and hybrid vehicles. "FAME-India or Faster Adoption and Manufacturing of Hybrid and Electric vehicles in India as part of the National Mission for Electric Mobility is being launched from April 1," the Department of Heavy Industries.

Public transportation plays a social role in the

urban environment. Environmental quality is an indicator of regional quality of life, supporting the health and well-being of the public and the attractiveness and sustainability of the urban and natural environment. We can charge the battery using two methods they are wired and wireless. Inductive charging, also known as wireless charging, has found much successes and is now receiving increasing attention by virtue of its simplicity and efficiency. The most important distinctive structural difference between contactless transformers and conventional transformers is that the two „coils“ in the former are separated by a large air gap. Compared with plug and socket (i.e., conductive) charging, the primary advantage of the inductive charging approach is that the system can work with no exposed conductors, no interlocks and no connectors, allowing the system to energy transfer system. However, work with far lower risk of electric shock hazards. As the charging system is often fully enclosed, wireless charging can be realized in waterproof packages and as such, wireless charging is attractive in situations at which rechargeable devices need to be frequently used near or even under water as well as in humid conditions. Broad application of wireless inductive-coupled contactless energy transfer systems is stymied by their fast declining efficiency performance as a function of wireless relative energy transfer distance. This relative measure is defined as the actual energy transfer distance divided by the radius of the wireless inductive recent improvements in semiconductor technology provide an opportunity to almost gratuitously improve on the system efficiency, because a higher operating frequency, in general, benefits the inductive energy transfer.

### 1.2 LITERATURE SURVEY

In today's era ,almost all buses operate on petrol or diesel . the major problem with this buses is air pollution which is harmful form an kind solution for these problem is the buses which operate without such fuel .The first BRT bus was the redeintegrada De transport in Curitiba ,brazil.

In order to control the situation there is a method in which instead of using a fuel implemented the electric bus. This bus

is eco-friendly and uses renewable energy. As an optional part charge through the circuitry. Along with this the BRT bus indication unit i.e. signaling system and verification system is also provided to verify the BRT bus and to indicate the status of the bus. After that to develop the concept of transferring power without use of any wire. the concept is based on conversion of low to high frequency. High frequency is transmitted into inductor through air core by using two self-resonating coils, non-radiative power is transmitted over distance upto thrice the radius of the coil of inductor. "Radio-Frequency Identification"(RFID) is better than barcodes. In many circumstances, RFID offers advantages over traditional barcodes. The big difference between the two is that barcodes are line-of-sight technology. That is, a scanner has to "see" the barcode to read it, which means people usually have to orient the barcode toward a scanner for it to be read. This paper proposes RFID system for user identification and charging authorization as part of smart charging infrastructure which is providing charge monitoring and control.

One advantage of RFID is that the technology doesn't require line of sight. RFID tags can be read as long as they are within range of a reader. Barcodes have other shortcomings as well. If a label is ripped or soiled or has fallen off, there is no way to scan the item, and standard barcodes identify only the manufacturer and product, not the unique item. For example, the barcode on one milk carton is the same as every other, making it impossible to identify which one might pass its expiration date first.

The K9 has following specification:

- 1) Electric power consumption: less than 100kWh/60mins
- 2) Acceleration: 0-50 km/h in 20s
- 3) Top speed: 96 km/h
- 4) Normal charge: 6h for full charge
- 5) Fast charge: 3h for full charge
- 6) Overnight charging: 60 kW Max power to fully charge the bus within 5h

### 3. BLOCK DIAGRAM

Block Diagram of this paper is consist of main three parts first is the Bus Depo unit, second is the bus stop unit, and last one is the Bus unit.

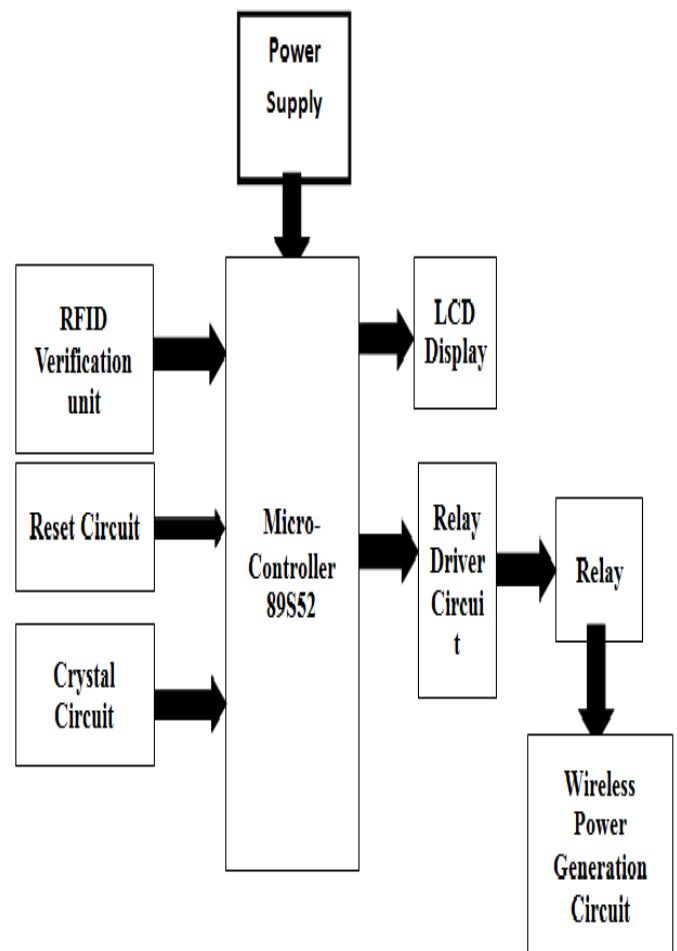


Fig- 1 : Block diagram of eco friendly bus

At bus stop unit, the bus verification unit identifies the bus by sending the bus info to controller. Then the controller switch ON the relay through relay driver circuit. Then the relay activates "contactless power generation circuit" through inductive coupling where the battery gets charged. The current status of the battery is displayed on LCD. RF wireless module will send the bus location updates to depo. In bus unit, it consists of wireless zone receiving circuit and solar panel, through which charging of the battery is done. At first the moderator unlocks the system by entering the password. Then the RFID tag is identified by the RFID reader and it is processed by the microcontroller. Here it also shows the status of the bus.

The elements of block diagram:

1) Microcontroller

The signals from EM Transponder are given to the Microcontroller. Microcontroller processes all these signals and gives data to LCD display.

2) EM reader

When EM transponders come in the range of EM reader it will read the unique id number. Features:-

Fully-integrated, low-cost method of reading passive RFID transponder tags. Single-wire, 2400 baud Serial TTL interface to PC, BASIC Stamp and other processors.

Requires single +5VDC supply. Bi-colour LED for visual indication of activity.

### 3) EM transponder

EM transponders are used for unique identification. There are two types of RFID tags:

#### i) Active RFID

Identification system in which tags have their own power source (usually a battery), enabling them to broadcast an identifying signal. This extends the range of the tags and the capability for communicating advanced information such as location.

#### ii) Passive RFID

Identification system, in which the tags are not powered, relying on active signals from the location transmitters for their response. This limits the range of the tags to a few feet.

### 4) LCD display

It is used for the displaying the information.

### 5) Relay

It is used to drive AC/DC Load & also used for auto switching purpose.

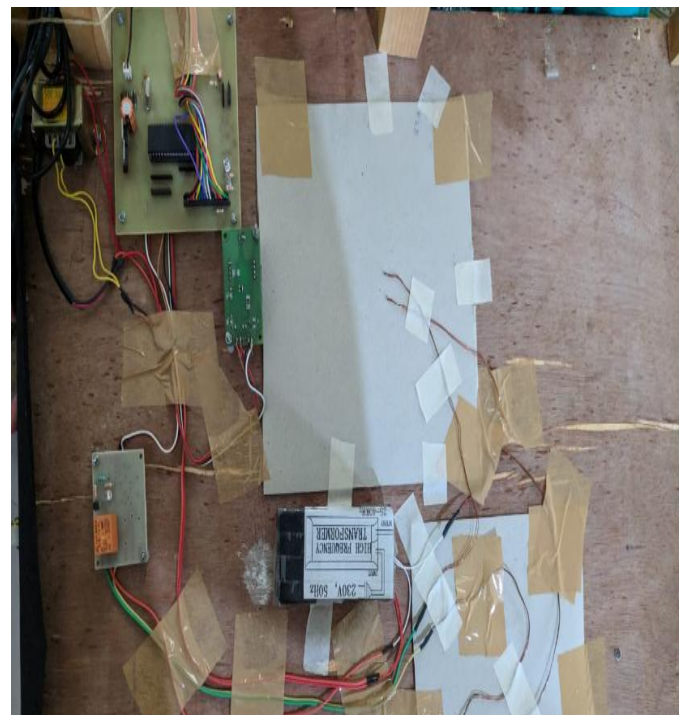
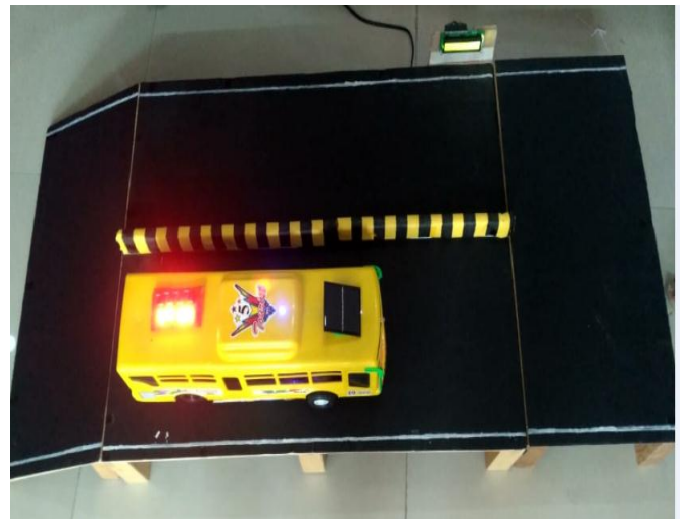
### 6) Solar cell

It is used to convert sun energy into electrical energy. Photovoltaic (PV) systems convert light energy directly into electricity. Commonly known as "solar cells." The simplest systems power the small calculators we use every day. More complicated systems will provide a large portion of the electricity in the near future. PV represents one of the most promising means of maintaining our energy intensive standard of living while not contributing to global warming and pollution

### 7) Battery

A battery is a device that converts chemical energy directly to electrical energy. There are two types of batteries: primary batteries (disposable batteries), which are designed to be used once and discarded, and secondary batteries (rechargeable batteries), which are designed to be recharged and used multiple times.

## 4. Actual Visualization of Circuit





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## 5. CONCLUSIONS

The main purpose is reduce Co2 emission and fuel saving. In this paper, a wireless energy transfer system based on transformer principle for power transmission and recharging of electrical devices is studied. This paper illustrates a method for wireless transfer of electric energy and information.

BRT is considered one of the promising high-performance, cost effective solutions that provide high quality services to the users. In short we are developing a charging unit based on wireless energy transform which charge the bus.

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