iJRASET
International Journal For Research in Applied Science and Engineering Technology

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 8 **Issue:** IV **Month of publication:** April 2020

**DOI:**

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.429*
*Volume 8 Issue IV Apr 2020- Available at www.ijraset.com*

# Automatic Braking System for Locomotive

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***Abstract:*** ***The objective of this project report is to manage the control brake system electric locomotive if only locomotive crosses the red signal. The signal will be transmitted in locomotive within a range. When train arrives at the red signal then the train have to be stopped manually. Then the mechanical brakes are applied to the electric locomotive. If once the train crosses the red signal due to various reason loco such as pilot-unable to stop train then the train will be stopped automatically. Here we are using electromagnetic coil and the signal transmitter and Infra-red transmitter-receiver pair at the signaling pole and locomotive and electromagnetic sensor at the locomotive. The signals will be transmitted to the locomotive coming across. The IR transmitter receiver pair is used for the accuracy and backup. The electromagnetic coil at pole will create the field according to the signal around the pole, this field will be sensed by another coil placed inside the locomotive and it will automatically perform the respective operation. Each of the stations alternately using a different set of frequencies to avoid interference between stations on the same frequency.***

***Keywords: Electromagnetic, Infrared, IR***

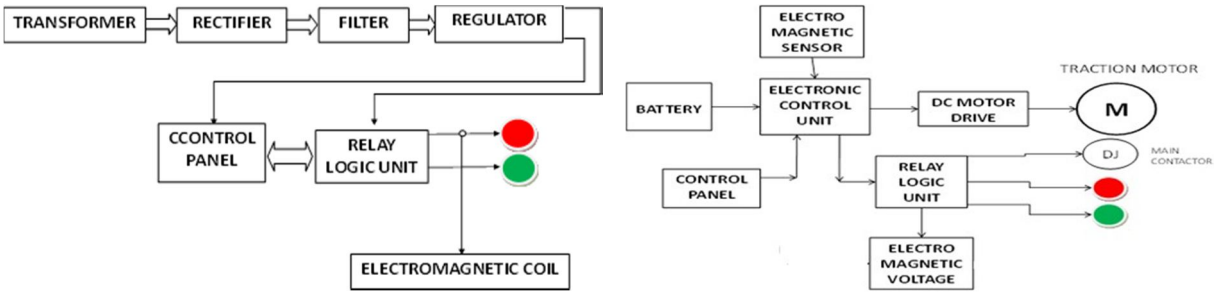
## I. INTRODUCTION

In this project we have controlled the braking system according to the signal, here we are mainly using electromagnetic coil and electromagnetic sensor. This electromagnetic sensor will attached to the red signal only, when signal is red this electromagnetic coil will gets charged and it will create an electromagnetic field across it. Whenever the train crosses the red signal then the sensor coil in the locomotive will cuts the flux of that field and this sensor will sense the field.[5] Once the sensor gives the signal to electronic control unit it will waits for few seconds to loco-pilot to respond or to apply the brakes, otherwise with the help of decoding counter electronic control unit will step wisely reduce the speed of the traction motor.[1]The speed of the traction motor will reduces only done by electrical braking only. IR transmitter will be placed at the pole and the receiver at the locomotive, when system fails to create the magnetic field then this will act as a backup for the system. This infra-red will be active when the signal is red.

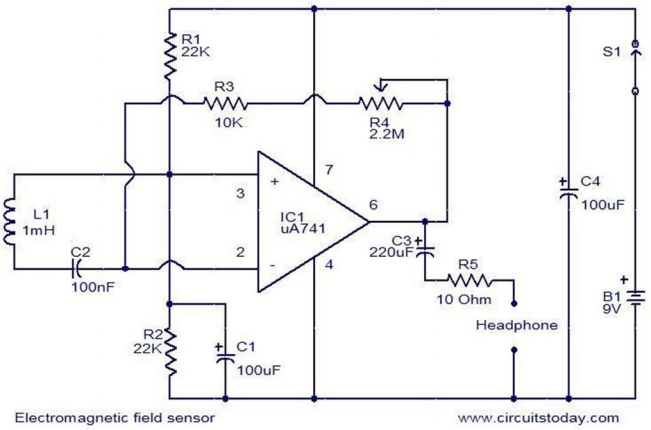
## II. METHODOLOGY

Brake is a essential feature in order to limit the speed or low down the speed of a train. Also stop signal must be far away so that sufficient distance is to be maintained for the braking system. This will helpful for the reduction in utilization of track. Electro-dynamic and electromagnetic braking of trains is explained in this paper. Depending on the magnitude of the field measurement, magnetic field sensor can be classified unto four different categories. Magnetic field sensor having more sensitivity has to be employed so that the field is to be measure below the geomagnetic noise. To cancel the spatial correlated noise for the betterment of spatial resolution, sensors at different location has to be located for magnetic detection. Proto-type sensors were constructed showing considerable promise. Measurement accuracy in excess of 1 cm see-l seems feasible with devices suited to long term battery operation. The inertial effects and many of the reliability problems inherent in moving part devices would be overcome by USC of an electromagnetic sensor. This is a very simple circuit that can be used to sense electromagnetic radiations. The circuit can even detect hidden wrings. A 1mH inductor is used for sensing the electric fiel

## III. BLOCK DIAGRAM



## IV.CIRCUIT DIAGRAM




## V. WORKING

In this project we have controlled the braking system according to the signal, here we are mainly using electromagnetic coil and electromagnetic sensor. This electromagnetic sensor will attached to the red signal only, when signal is red this electromagnetic coil will gets charged and it will create an electromagnetic field across it. Whenever the train crosses the red signal then the sensor coil in the locomotive will cuts the flux of that field and this sensor will sense the field. Once the sensor gives the signal to electronic control unit it will waits for few seconds to loco-pilot to respond or to apply the brakes, otherwise with the help of decoding counter electronic control unit will step wisely reduce the speed of the traction motor. The speed of the traction motor will reduces only done by electrical braking only. INFRA RED transmitter will be placed at the pole and the receiver at the locomotive, when system fails to create the magnetic field then this will act as a backup for the system. This infra-red will be active when the signal is red.

## VI.CONCLUSION

Tests were carried out on the prototype device to see its effectiveness as to what degree it meets its expected performance. The system which is the design and construction of an anti-collision system for vehicles was designed considering some factors such as economy, availability of components and research materials, efficiency, compatibility, portability and also durability. The performance of the system after test met design specifications. The general operation of the system and performance is dependent on the presence of two moving cars as they get closer to each other.

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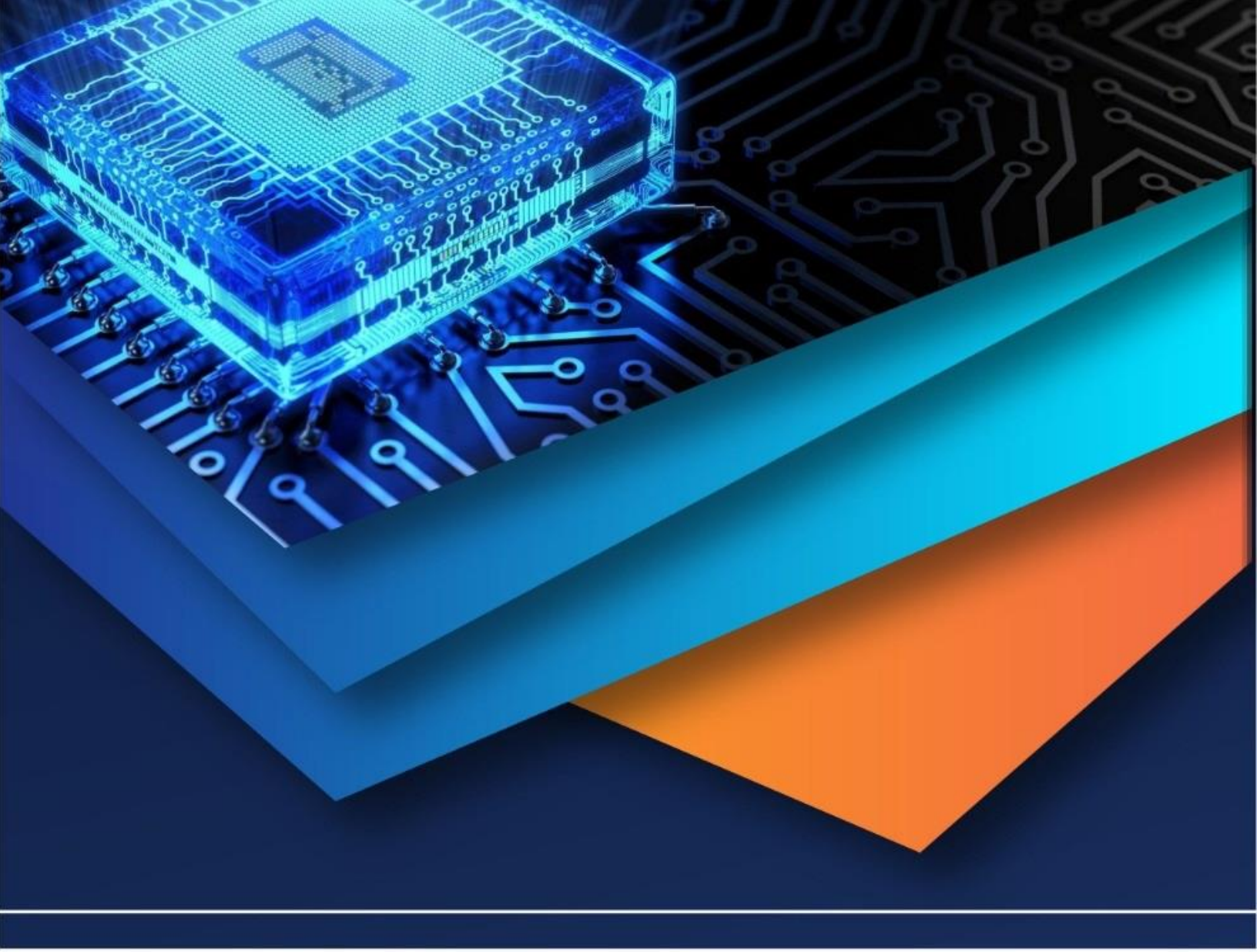

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