

Driverless Metro Train Using 18F2520 Microcontroller

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ABSTRACT

Today's in this developed country modern technologies are helpful in all aspects of our life. Due to this lots of development are done in the field of transportation. The technology of metro train movements are used in most of the developed countries. The introduction of this developed metro system greatly reduced the dependency of human to drive the train and offered greater flexibility in the system operation. Driverless train equipped with a control system which programmed to follow a specific path. The train consists of Microcontroller 18f2520 which act as the C.P.U of the system that enables the automatic stopping of the train from one station to another one. This concept of Driverless metro improves the management system of the railway network, reduce human errors, consume less power, and provides greater comfort and safety to the passengers during travelling.

Keywords : DC Motor, IR Sensors, limiting count of passengers, Metro train 18f2520 microcontroller.

I. INTRODUCTION

The project is developed to understand the technology used in driverless metro train system which is mostly used by the developed countries. The operation of the metro system is controlled by microcontroller 18f2520. The train is predefined to follow a specific path. The whole operation of the train is controlled and performed by a controller so it does not require a driver or train attended for the operation of the train. The automated train equipped with the C.P.U controls the whole operation of the train movements.

Some other additional features like LCD Display to give the messages to the passengers, Buzzer to give indication to the passengers for LCD Display to give messages to the passengers, automatic door controlling passenger counting section by using IR modules. This all equipment are included in this project.

BLOCK DIAGRAM

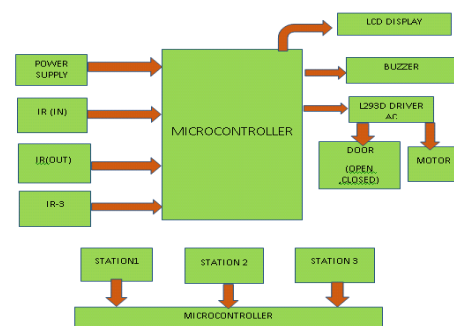


Fig 1

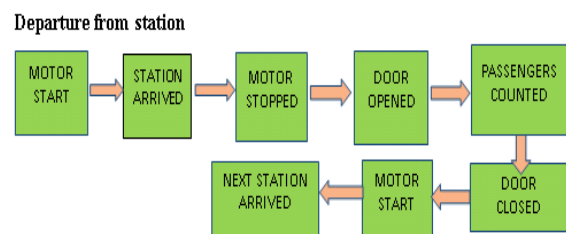


Fig. 2

IMPLEMENTATION

The working of this project can be explained by the state diagram for the arrival and departure of the train in two station.

We have Microcontroller 18f2520 which is the main controller. The supply of 5V is provided to the microcontroller from the power supply of 12V battery. All the components which are used for different operation are connected to the microcontroller.

At first, the train will get supply from a source and get ready to move.

The train will display a message “The train will arrive at the station no.1 in few minutes” with buzzer operation.

12V Battery is used for giving supply to the motor drive and door motor.

After getting supply microcontroller get turned on. Microcontroller programmed accordingly and train start moving towards STATION 1.

As soon as it arrive at station 1, the BUZZER give indication, and The state of the MOTOR operate from on state to the off state to stop the motor at station 1.

The Motor of 5V is used for the opening and closing of the Door. The Microcontroller give signal to the motor to open the door at the station no.1.

Now the passenger counting action came into action and count the passenger by use of IR Modules and display it on the LCD Display ie. “the no of passengers entered”. A time of about 5sec is given as stoppage time of train per station. Now, after few seconds a message of “door is closing will appeared”.

The Microcontroller give signal to the motor to start running towards STATION No.2. The whole

operation of departure and arrival is repeated on every station during the train operation.

Now, the LCD display the Passenger counting action came into action and count the passenger using IR MODULES and display it on the LCD.

An additional of obstacles detector is also provided in this project. The IR Sensors will detect the obstacles occur over the track.

CIRCUIT DIAGRAM

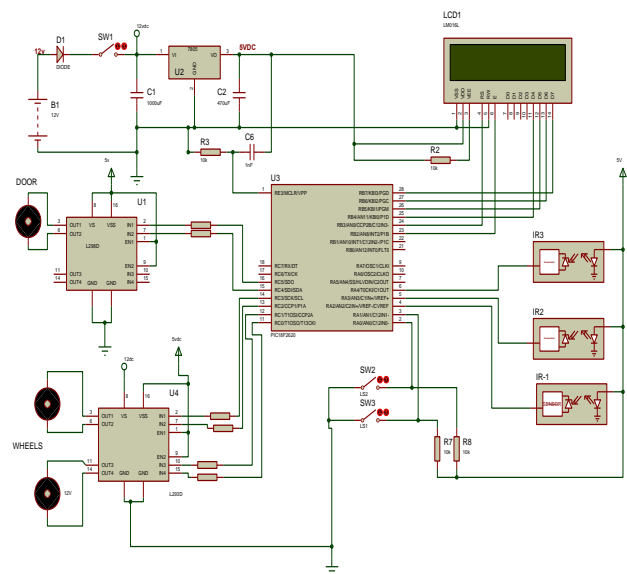


Fig. 3

II. RESULTS AND DISCUSSION

We have demonstrated the project by completely operating the model of driverless metro train. The driverless metro is working accordingly we have programmed in a proper sequence by following the action in step by step .ie. first the running of motor towards station 1, then stopping over station 1 as IR sensors got signals from microcontroller.

Further stopping of motor as station arrived, then the displaying of messages of counting the passengers, after few seconds allotted to the microcontroller, the motor start operating and move towards station no.2, This complete action is repeated each and every time station arrived.



Fig. 4

III. CONCLUSION

Our driverless metro train project gives unique features of fully automatic operation without any manual operation. It provides less travelling time , less consumption of energy, better services, quick responses ,It reduces the overall running cost, The passengers counting system counts the no of passengers till a certain limit of overload.As the limit surpasses the door automatically closed and also a time limit is also provided.

IV.FUTURE SCOPE

The metro train in this current project has provided a certain limit of counting system which counts the number of passengers till its limit after which the door automatically closed.

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