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IOT BASED PASSING TRAIN DATA ACQUISITION SYSTEM FOR RURAL STATIONS

V. Pavithra[*1], G. Harshitha[*2], T. Vinay[*3]

M. Mysaiah[*4]

[*1,2,3]Student, Electronics And Communication Engineering, ACE Engineering College, Hyderabad, Telangana, India

[*4] Professor, Department of Electronics And Communication Engineering, ACE Engineering College, Hyderabad, Telangana, India

ABSTRACT

In general, Express trains will not be halted at rural stations, but it is the duty of station master to record the passing train data. In this regard it is essential to acquire passing train data automatically through a smart phone that belongs to the station master. For this purpose, automatic train detection system that can acquire the passing train data to be installed at some reference point near the station and all the trains' data passing through this point is acquired and is transmitted through Wi-Fi module. This system is quite useful for specific persons in the railways to know whether the particular train has reached or not to the reference point in time. Infrared remote technology is used to acquire the passing train data, the received information is decoded through μC unit and it is transmitted to the concern mobile phone through Wi-Fi module. Entire system is designed as automatic and the demo module is constructed with one model train, for this purpose 4-wheeler trolley is used that is equipped with its data transmitter. This simulated train that moves over the metal track is designed to move manually over the track. The data acquisition system is designed to send information to the concern mobile number. For demo purpose, little length of metal track must be laid over the wooden plank.

Keywords: Wi-Fi module, IR sensor, IR receiver.

I. INTRODUCTION

The automatic Passing train data acquisition system developed here is a kind of information system which is quite useful for the station masters at rural stations. It is a real time information system derived using IOT technology by which passing train data can be transmitted to the smart phone that belongs to the station master. The idea of using this automatic data obtaining system is to monitor the passing train through a rural station is to observe that the specific train has been reached to that location as per the schedule time or not. Presently, the concern station master passes this information to the next station master through phone stating that so and so train just passes through my station. As the train passes from one station to other station, the information also passes from station to station through manual attention through phone. Sometimes in any station, if that station master not aware of passing train due to the busy or negligence, then he is answerable to his higher officials. If this kind of system is installed in each and every small station, this kind of difficulty can be avoided. Real-time information technology used here is an advanced version of system which recognizes fact about the passing train. In general, public transport services do not operate exactly according to the published time table. Thereby providing this kind of real-time automated information gathering systems, to some extent, better service can be expected from the railways because of this type of strong evidence devices installed in each and every small station.

II. OBJECTIVES

1. To track the data of the incoming train automatically using IR sender and receiver modules.
2. To display the name of the coming train on the LCD screen.
3. To send the data of passing train in the mobile phone application using Wi-Fi module.

III. METHODOLOGY

This device consists of an IR data receiver connected to the microcontroller. The train model is attached with an IR sender with another microcontroller connected to it. Microcontroller attached to the model train sends the data through IR-Transmitter. The receiver receives the binary data and decodes using microcontroller, every

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unique code is related to different train. The data is decoded and displays the name of the train on the 16x2 LCD screen. Also, the microcontroller at the receiver end is connected to an ESP8266 Wi-Fi module. This is used to upload the data to mobile phone application, so that, the train master can see the notification of the passing train and its data using his mobile phone.

IV. WORKING

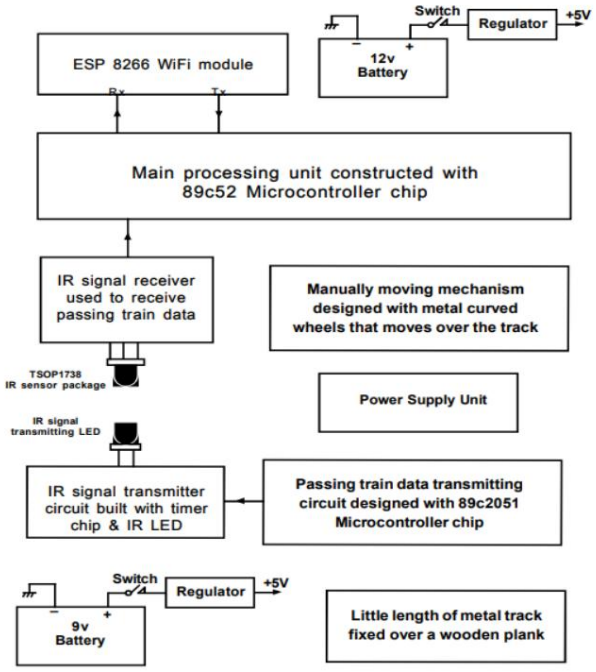

Figure 1: Block Diagram of project.

When a train passes through a station, the IR transmitter transmits the signal to the IR receiver. The IR receiver sends the signal to the AT89C52 IC which decodes the signal and passes the information to the LCD. The Wi-Fi module receives the signal from AT89C52 IC and this Wi-Fi module sends the notification to the station master mobile. The step-down transformer is fed with 12v battery which equally transmits the battery to all the components.

V. RESULTS AND DISCUSSION

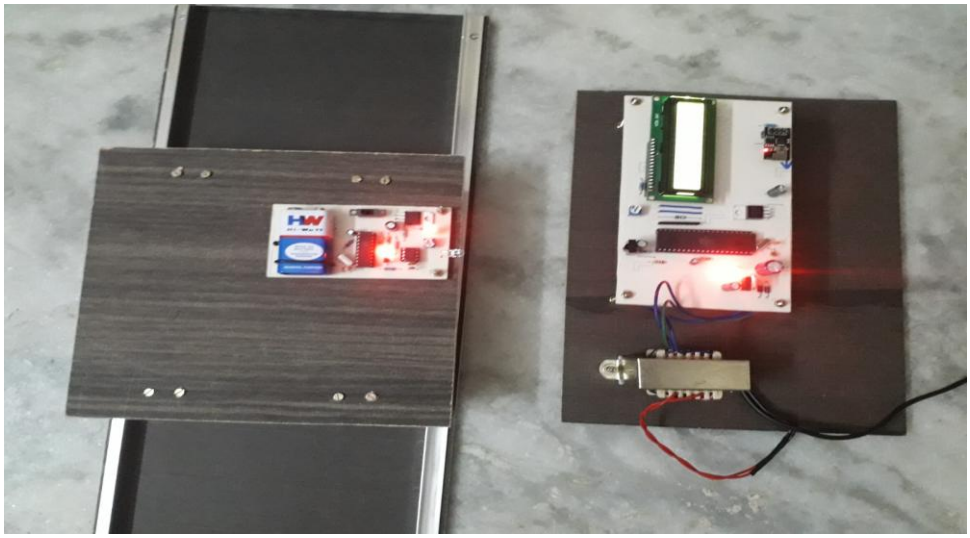

Figure 2: The hardware of the circuit provided with power supply.

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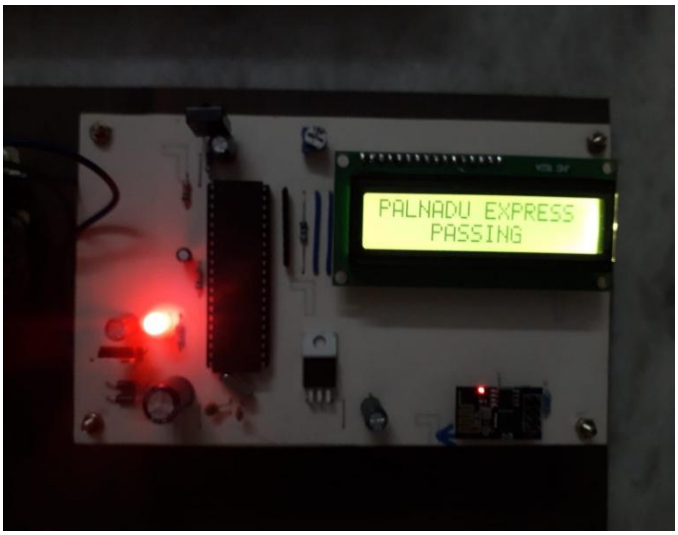

Figure 3: Device at receiver end displaying the passing train data in LCD Screen

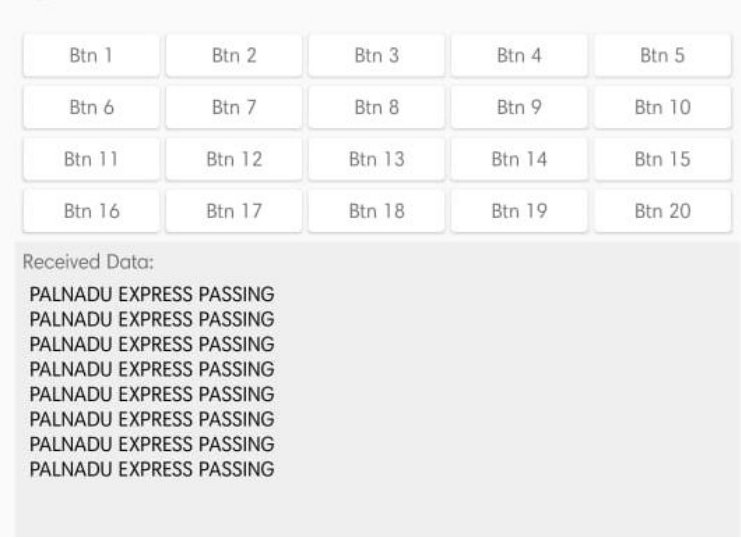

Figure 4: Device at receiver end displaying the passing train data in Mobile Application

VI. CONCLUSION

The main motto of this project is to implement the train data tracking system at rural areas, where the auto-tracking system is not implemented. Vehicle tracking system makes better fleet management. The parallax errors which occur rarely in case of trains in the rural areas will also get reduced. Whenever the station master is not in front of the screen, he can use his mobile to note the data of the passing train using Wi-Fi module and the mobile application. However, the drawback of this project is the speed of IR module, as it cannot receive the data from a fast-moving train. This can be improved using other data transmission modules in future scope.

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