ISSN 2394-3777 (Print)
ISSN 2394-3785 (Online)
Available online at www.ijartet.com

International Journal of Advanced Research Trends in Engineering and Technology (IJARTET)
Vol. 4, Special Issue 11, March 2017

WIRELESS TRIAN CONTROL SYSTEM USING LIFI

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Abstract - Li-Fi - Light Fidelity has a bidirectional, high-speed and fully networked in wireless communication technology and similar to Wi-Fi. The term was 1st formulated by Harald Haas , a German Physicist from the University of Edinburgh , and is a form of visible light communication(VLC) is a part of optical wireless communications (OWC) and could be a complement to RF communication (Wi-Fi or cellular networks).This paperpresented the working of Li-Fi by simulating a simple circuit which gave us the required output.

Keywords: Li-Fi, Wi-Fi, LED (Light Emitting Diode), Optical Communication,stepper motor.

I.INTRODUCTION

Li-Fi stands for 'Light Fidelity'and it has VLC(Visible Light Communication), technology developed by team of scientists contain by Dr. Gorden Povey, Prof. Harald Hass and Dr. Mostafa Afgani . The University of Edinburgh Li Fi has now a part of Visible Light Communication(VLC) PAN IEEE802.15.7 Standard."Li-Fi is usually implemented to white LED light bulbs".These device are normally used for illumination by Appling a constant current through the LED . Li-Fi is the term that had been used to label the fast and cheap wireless communication system, which has the optical version of Wi –Fi . Li-Fi has light based Wi-Fi that is uses light instead of radio waves to transmit information.

II. RELATED WORKS

When theData from an internet and the local network that hasbeen used to modulated the power of LED(Light Emitting diode) when light source is in the way to undetectable human eye. The photodetector hold up the signal, which it is converted back to a data stream and sent to the client. The client has to communicate through its own LED and the output are over though the existing network. Operational procedure that had been very simple, if

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the LED is on, transmit a digital to 1, if the LED is off , transmit a digital to 0. When the LEDs is switched on and it willswitched off very suddenly, which it gives nice opportunities to transmitting data. Hence it allbe considered to someLEDS and then it will be controlled through the code data intothose LEDs. We have been to just vary the rate of LED's flicker depending upon the data we want to encodethese every light source and it will be works as a hub of data transmission. On one end of it data , the internet will be streamed to a lamp driver and when the LED is turned on and the microchip converts into digital data is in the form of light sensitive device (photo detector) received by the signal from the converts and it back into the original data. These method had been rapidly pulsed thought the light to transmit the information wirelessly is to technically referred as Visible Light Communication.

III.EXISTING SYSTEM

The existing signalling system in Indian railways is the semi automatic system whereas in most of the placing manpower is used for the track changing of the trains At the Signals have aspects and indications. The aspect is the visual appearance of the signal These signals display their different indications to train drivers by changing the angle of inclination of a pivoted 'arm'. installed on posts At first the most important thing to say that "A Driver of a train shall not start his train until he is authorised to do so". To give authority to the driver to start, signal posts have been erected at various places to indicate him whether to start or not To ensure a train shall proceed safely from one station to other there are various systems of working adopted in Indian Railways. The system adopted depends upon the density of traffic, i.e. more the number of trains the more costly the system adopted. The driver interprets the signal's indication and acts accordingly. These signalling ''arms'' are controlled mechanically by human resource On most modern railways, colour light signals have largely replaced mechanical ones. Colour light signals have the advantage of displaying the same aspects by night as by day, and require less maintenance than mechanical signals. But when human error occurs while changing the track there are chance of collation of train results in loss of human life and also heavy loss to the railway department.

IV.PROPOSED SYSTEM

Here a new system is proposed to surmount the demerits of existing system To overcome the above drawback fully automatic system for track changing can be adopted in this system the driver need not interprets the signal's indication When trains run in opposite directions on a single-track railroad each train must wait for the other at a passing place. Neither train is permitted to move before the other has arrived .A Sensor must be placed near the driver position which senses the signal color and allows the train to run or stop accordingly to the color of the signal and ensure a train shall proceed safely from one track to track. In the semi automatic system The timetable system has several disadvantages. First, there is no positive confirmation that the track ahead is clear, only that it is scheduled to be clear. The system does not allow for engine failures and other such problems . Trains cannot collide with each other if they are not permitted to occupy the same section of track at the same time, so railway lines are

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divided into sections known as blocks. In normal circumstances, only one train is permitted in each block at a time. This principle forms the basis of most railway safety systems. Although signals vary widely between countries, and even between railways within a given country, a typical system of aspects would be:

Green: Proceed at line speed. Expect to find next signal displaying green or yellow.

Yellow: Prepare to find next signal displaying red.

Red: Stop.

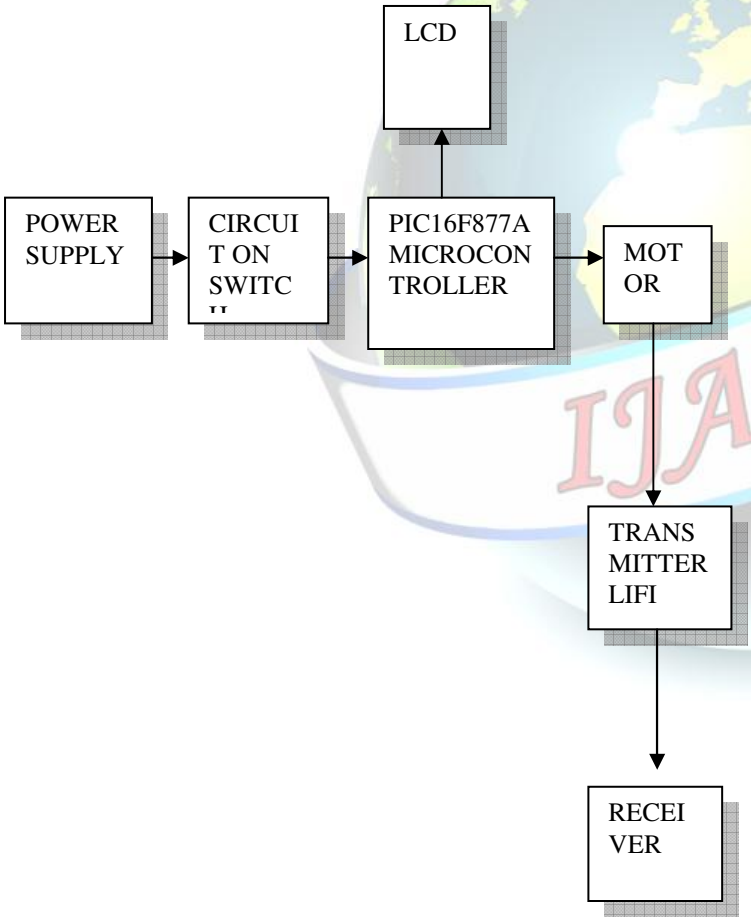

Fig.1 Block diagram of overall proposed system

The whole track length is divided into intervals with signal posts at each end. The signal at a signal post is indicated by sensing the occupancy of track at next interval. A signal will be red if the interval just ahead is occupied by a train. If the interval just ahead is not occupied by train, but the succeeding interval is occupied, the signal shows yellow. Similarly, if the two intervals ahead are empty and third interval is not, it shows double yellow. The signal shows green if three intervals ahead are empty. For example, if the green signal fails, the next permissive signal 'double yellow' will be displayed. If 'single yellow' fails, next permissive signal 'red' will be displayed. If 'red' signal fails, the standby 'red' signal is displayed. In the above system where sensors are used for track changing the system will not depend the trivets and automatically controls the trains while running or track changing by sensing the signals and ensure the safety of trains as well as the life of the passengers . The sensor interprets the signal's indication and acts accordingly.

PIC16F877A:

The PIC16F877A CMOS FLASH-based has 8-bit of microcontroller in upward compatible with the PIC16C5x, PIC12Cxxx and PIC16C7x devices. It features 200 ns instruction execution, 256 bytes of EEPROM data memory, self-programming, an ICD, 2 Comparators, 8 channels of 10-bit Analog-to-Digital (A/D) converter, 2 capture/compare/PWM functions, a synchronous serial port that can be configured as either 3-wire SPI or 2-wire I2C bus, a USART, and a Parallel Slave Port.

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LCD:

16×2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5×7 pixel matrix. This LCD has two registers, namely, Command and Data.

Motor:

Amotor has an electrical machine that converts electrical energy into mechanical energy. The reverse is the conversion of mechanical energy into electrical energy and is done by an electric generator. Here we are using stepper motor for changing the track .

Transmitter LIFI :

Li-Fi is the term that had been used to label the fast and cheap wireless communication system, which has the optical version of Wi –Fi . Li-Fi has light based Wi-Fi that is uses light instead of radio waves to transmit information . it is used for transmitting the signal though receiver.

Receiver:

Received the transmitting signal and view through the sensor . The sensor will detect the required signal to change the track . A major challenge facing Li-Fi is how the receiving device will transmit back to transmitter.

V.CONCLUSION

On implementing this technology it's possible to use every bulb as a hotspot, which produces a safer environment. Instead of human supervision the same work can be done by the sensors which senses the signal automatically and operate the train depends upon the color of the signal for example for example if the green signal glows the train moves with the same speed and changes the track if the green signal fails, the next permissive signal 'double yellow' will be displayed. If 'single yellow' fails, next permissive signal 'red' will be displayed. If 'red' signal fails, the standby 'red' signal is displayed and the train will stop automatically. with this pre-programmed system collisions of train will be totally avoided during track changing and the human life will also be saved.

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