

ANTICOLLISION AND SPEED CONTROL

Prof.R.A.Thakre
Department of Engineering in E&TC
AISSMS's Institute of information Technology
Pune, India.

1st kulkarni omkar shripad
Department of Engineering in E&TC
AISSMS's Institute of information Technology
Pune, India.

BASED AUTOMATIC RAILWAY

ABSTRACT:-

The aim of this project is to control the speed of railway , avoid the accidents , collision of railway , detection of obstacle occurred in the line of railway also controlling the opening and closing of railway gates without manual interference. Also the status of railway is to be sent to control room using GSM technique . due to this automation human interference will be less which will result into better accuracy and less waiting time at railroad crossing and railways will be on time.

KEY WORDS: speed control technique, Anti collision technique using ULTRASONIC, Gate control using IR and GSM technique.

INTRODUCTION:

As we know railways travels thousands of miles and rail network is very wide and most popular way of transportation as it is cheaper and faster, so railway safety is measure factor to work.

As it is preferred more n more day by day more the traffic is increasing railways must be capable and more efficient.

Also considering the environmental factors

Road traffic is more polluting than railways so environmental awareness people must use railways.

Railway safety is very important to be consider in all over world, as the rail accidents are featuring regularly in news channels and news papers and many people loses their lives in this accidents . indian railway is mainly facing issues like aging of rail tracks due to which train speed is getting reduced day by day other countries are trying to increase the speed and indian railways are getting slower due to this time delay in schedule is increasing day by day.






Rail accidents in India is greater compare to other countries , this may be due to man made errors and negligence of operators.

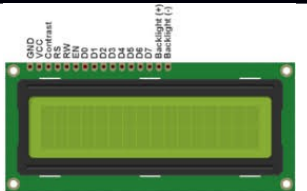
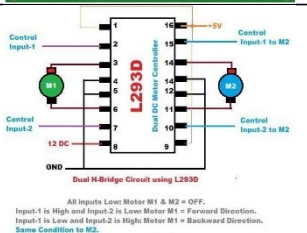

As indian railway is lagging with modern technology and management due to which the talented persons is not able to join.

Current system is with excess staff and manpower and results with saturation in technology up gradation.

In the present project almost all the operation is tried automate , controlling of railway gate using IR, speed control using TSOP, obstacle detection and anti collision using ultrasonic sensor.

2.METHODOLOGY:

<p>MICROCONTROLLER (PIC18F4550)</p>	
<p>ULTRASONIC SENSOR</p>	
<p>IR SENSOR</p>	
<p>GSM MODULE</p>	
<p>TSOP SENSOR</p>	

<p>16*2 LCD DISPLAY</p>	
<p>MOTOR DRIVER (L293D)</p>	
<p>MOTORS: DC MOTOR, STEPPER MOTOR</p>	

working of the system can be explained in following steps:

- 1) Two IR sensor will be used at railway gate crossing one at each side for detection of railway arrival and passing
- 2) Initially train is at railway platform and get started.
- 3) When railway crosses first IR sensor present at turn train speed reduced to 50% which indicates turn is started
- 4) After crossing second IR train speed is increased to maximum which indicates turn ends.
- 5) When train arrives at railway gate crossing and crosses the first IR sensor railway gate is closed and when train crosses second IR sensor gate is opened.
- 6) Ultrasonic sensor is used as anticollision model as well as obstacle detection which is placed at front end of railway engine, when ultrasonic sensor receives a signal from very short distance it stops the railway.
- 7) GSM module sends a current status of railway to control room
- 8) When train arrives near the platform reduced to 25% .
- 9) At last when train crosses next IR train is stopped as platform arrival .

3. HARD WARE IMPLEMENTATION

The system developed has following features

1. Gsm is used to identify the status of railway and notify it to control room.
2. IR sensor based railway gate control.
3. Ultrasonic sensor based anti collision technique and obstacle detection.
4. speed controlling of railway using TSOP sensor.

Fig.1 shows the block diagram of presented system which consist of power supply, sensors, controller, dc motor and gate control assembly.

3.1 power supply

The power supply is made up of the step down transformer, bridge rectifier, capacitor filter and voltage regulator to convert 230 v AC into 12v regulated DC

regulated power supply is needed for continuous and proper working of system

IC lm7805 is used

3.2 GSM Module

A sim800a GSM module is used which interfaces a GSM modem with wit microcontroller system standard interfaces like Serial Port, USB etc., as the power provided by the controller is not enough to modem separate power supply ckt is designed and can be connected to mains with the help of adapter.

3.3 Anti-Collision Module

Ultrasonic sensor is used in anti-collision module which works at ultra high frequencies. In which ultrasonic transmitter send the signal in forward direction and if the obstacle occurs these signals are bounced back and receiver which is placed next to transmitter. receiver accepts the signal and generate the signal of detection.

3.4 Speed control assembly

Speed control assembly is made up of single TSOP receiver placed on the train and multiple transmitter placed at ground. Six transmitter are used placed at start of the turn, end of the turn, at a short distance away from platform and one at platform. Here this detected signal I given to controller as speed control signal.

3.5 Railway gate control assembly

In this assembly two IR sensors are used as input to controller one pic18f4550 microcontroller is used for control action and stepper motor is used to drive the railway gate also red and green LED is used as stop n go indication.

3.6 Motor driver circuit

L293D motor driving IC is used to drive the motor as the output of controller is not sufficient to drive the dc motor directly. this IC convert the low voltage 1v signal into 12v signal using external power supply which is capable enough to drive the motor continuously.

3.7 Display

A standard 16*2 LCD display is used for indication of current status of railway a distance measured by ultrasonic sensor current speed of railway.

3.8 Pic18f4550 microcontroller

it is most popular controller developed by microchip technology. It belongs to pic18f family. it is low power high performance, enhanced flash based microcontroller with USB support. It is 40 pin 5 port(port A,B,C,D &E) 8 bit microcontroller with following features. It is having 16 bit instruction set architecture, flash memory 32KB, 2KB SRAM, 256 bytes EEPROM. It is compatible with clocks ranging from 31KHz to 48MHz. available peripherals are ADC, comparators, timers. It is also equipped with communication protocols like EUSART, SPI, I2C, USB

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5.CONCLUSION

in this project all the keywords are covered and tried to automate various operation of railway such as controlling of railway gate , speed control which reduces the human interference and hence increases the accuracy and preciseness also it reduces the waiting time of road passengers at railway crossing. As the obstacle detection is using which helps in avoiding direct accidents and also save the life of humans as well as animals. As the present system is prototype it can be implemented for better future of railways.

5. REFERENCES

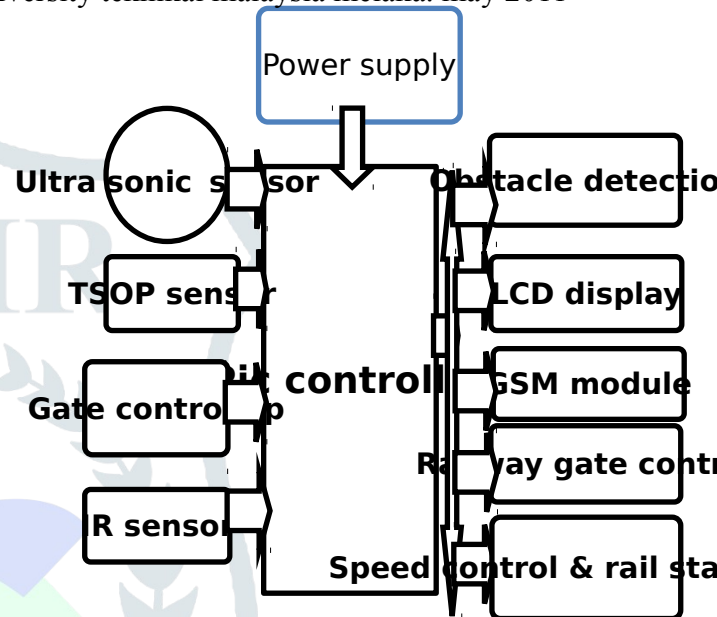


Fig..1 BLOCK DIAGRAM OF ANTI-COLLISION AND SPEED CONTROL BASED AUTOMATIC RAILWAY