

# Plc Based Traffic Light Control With Automatic Railway Gate Crossing

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**Abstract** - the primary goal of this project is to enhance the working of the railway gates. traditionally operated manually on a large scale, which welcomes the risk of human errors that could lead to massive accidents. the objective is to atomize the working of the railway gate by using plc (programmable logic controller) based system to operate the gates automatically with help of sensors. this automation not only enhances the system appearance but also reduces human efforts to open and close the railway gates. the system requires only supervision at particular instances which reduces human involvement at a large scale thus reducing the possibility of human error. the train is detected with the help of the sensors mounted at either sides of the gates that provides ne cessary signals to raise an alarm that provides information of the arrival of the train as well as its direction and then operate the gates. plc works as a backbone accompanied by a lot of other hardware and software used.

**keywords** - plc, capacitive sensor, dc motor

## I. INTRODUCTION

India is one of the country with the largest railway network. In the past few years we have seen the railway department turning itself towards advancement and evolution. In the era of atomization reducing human efforts and getting things done has been the higher priority in market. Gadgets and technologies taking over all the activities that human beings could do. The conventional railway device makes use of the caution lighting and human managed gates to alert the humans approximately an oncoming teach. When the teach leaves the station, the station agent informs the gatekeeper concerning the advent of the teach the usage of the cellphone and telegraph. The gatekeeper closes the gate relying at the timing at which the teach arrives. Hence, if the teach is overdue due to sure reasons, then gate live closed for an prolonged time causing site visitors close to the gates.

As an addition to the advancement we have proposed the idea of automating the existing railway crossing gate systems using Programmable Logic Controllers better known as PLCs which take in signals from the sensors mounted on the railway tracks that generates an alarm alerting the approach of a train, which further gives commands to the gates being shutted down. The gates are also monitored whether they shutted down or not by the sensors again which are mounted near the gate

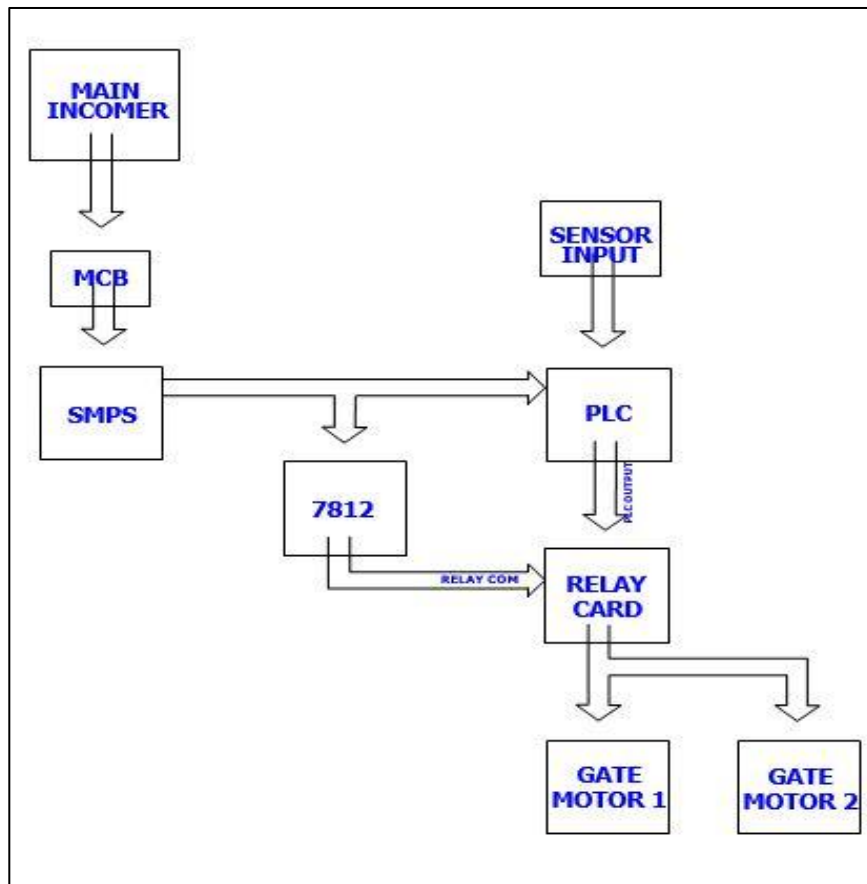
## II. PROBLEM STATEMENT

As motors are growing daily it has turn out to be extra hard to govern the gate manually. As a end result frequently coincidence happens and lots of humans turn out to be injured badly and on occasion it turn out to be very extreme while humans died because of this sort of injuries.

This mission can assist us to lessen injuries in our u . s . through introducing automated railway gate manage system

## III. SYSTEM DESCRIPTION AND METHODOLOGY

### BLOCK DIAGRAM



**HARDWARE USED**

1. PLC (Programmable Logic Controller) DVP16SP11R
2. Inductive Proximity Sensor
3. MCB (Miniature Circuit Breaker) A9N2P16B
4. 3-Terminal 1A Positive Voltage Regulator (7812)
5. 12V DC Motor
6. Realy Interface Modules
7. SMPS(Switching-Mode Power Supply)

**SOFTWARE USED**

WPLSoft

WPLSoft is a program-editing software made for the Delta DVP-PLC series used under WINDOWS. Delta PLC is a control system using electronic operations. It's easy storing procedures, handy extending principles, functions of sequential/position control, timed counting and input/output control are widely applied to the field of industrial automation control.

**WORKING**

First of all train will arrived at sensor S1 and as soon as sensor S1 sense the train then the siren / horn will scramble and red signale glow to the panel room at near station as well as the horn which is on gate so that the vehicle's on road will get warning sign that mean they will understand that gate is going to close and we have to stop.

Then train will arrive at sensor S2 , and gate start to close until gate close sensor is not turn on.as soon as gate close sensor is on then gate stop closing in another word we can say that the gate is now close so vehicle are safe and train can be pass.

Now train passes form gate and it is a safe distance and it can be sensed by S3 sensor but we don't open gate yet. Because there are more possibilities that sensor sense the other material which may dangerous.When train cross the sensor S3 and then train crosses the sensor S4 then we will open the gate and green signale will glow so that the vehicle will free to pass through gate to other side of the gate.

This procedure for train coming from right to left.

Now the same procedure will happen when train coming from left to right which means first the sensor S4 sense the train and same siren or alarm will scramble and red signal will glow

Then train arrive at sensor S3 then gate will close till close sensor

After train passes the gate then which can sensed by sensor S2 ,but still gates closed As soon as train passes from sensor S1 the gate will open and green signal will glow till gate open sensor On.

Now vehicle is safe to cross gates.

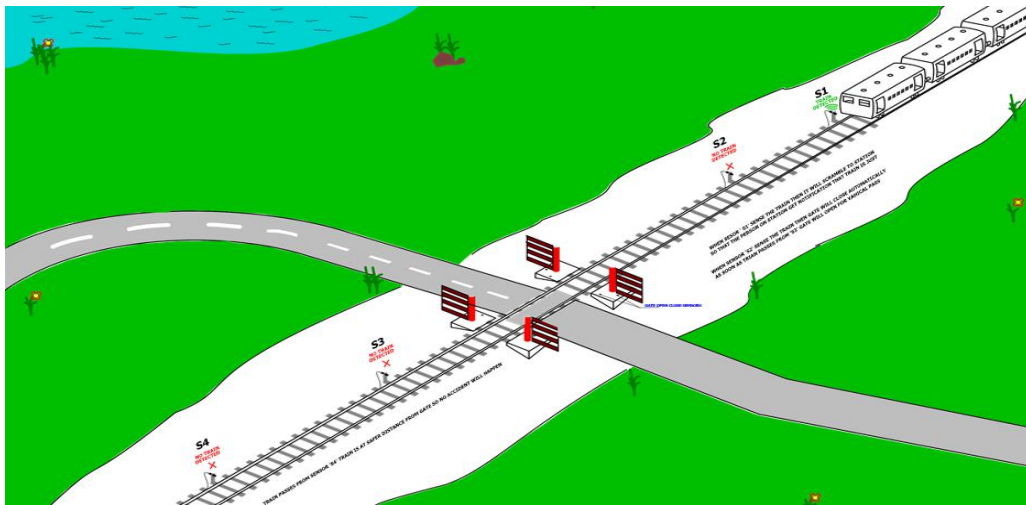


Fig.(a) .Train arrived at sensor S1

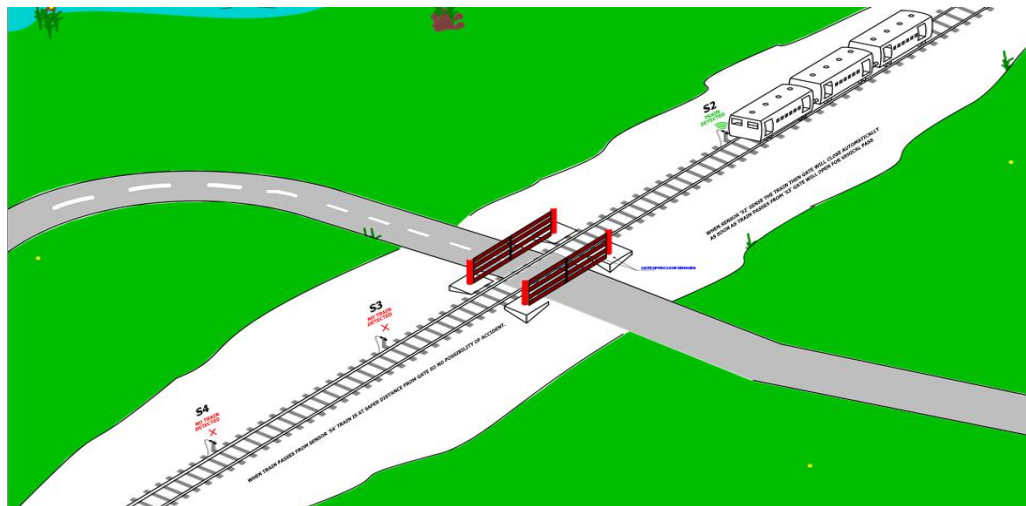


Fig.(b) .Train arrived at sensor S2

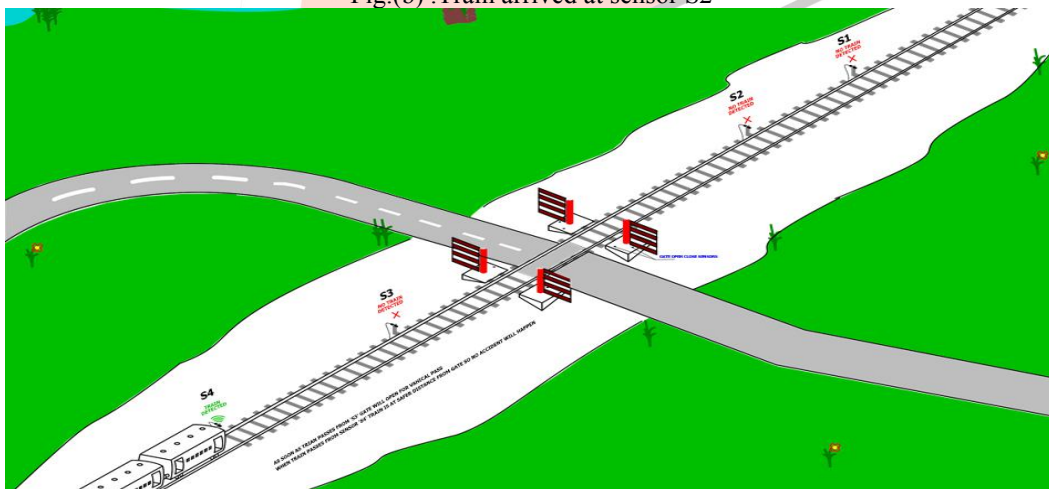
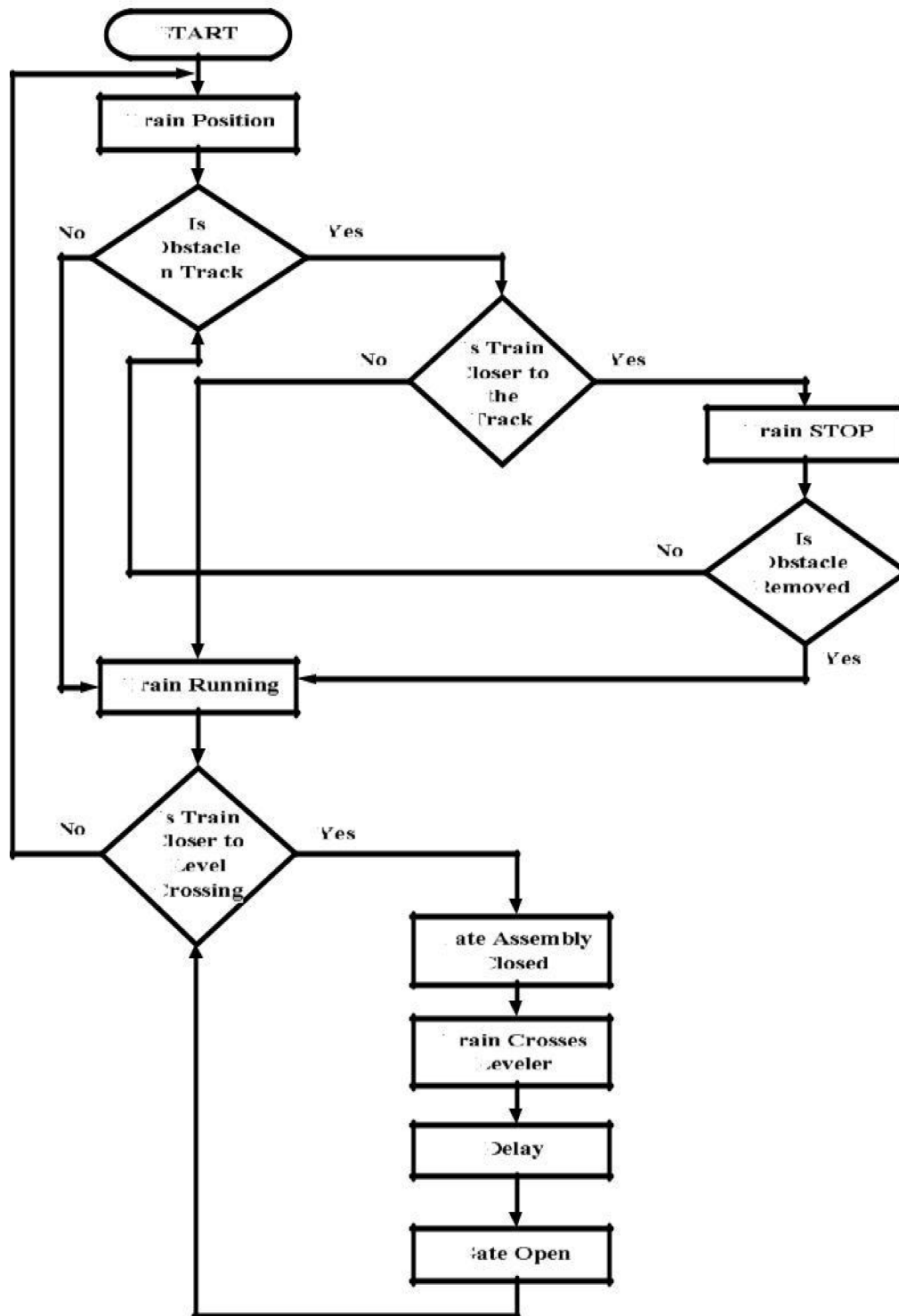
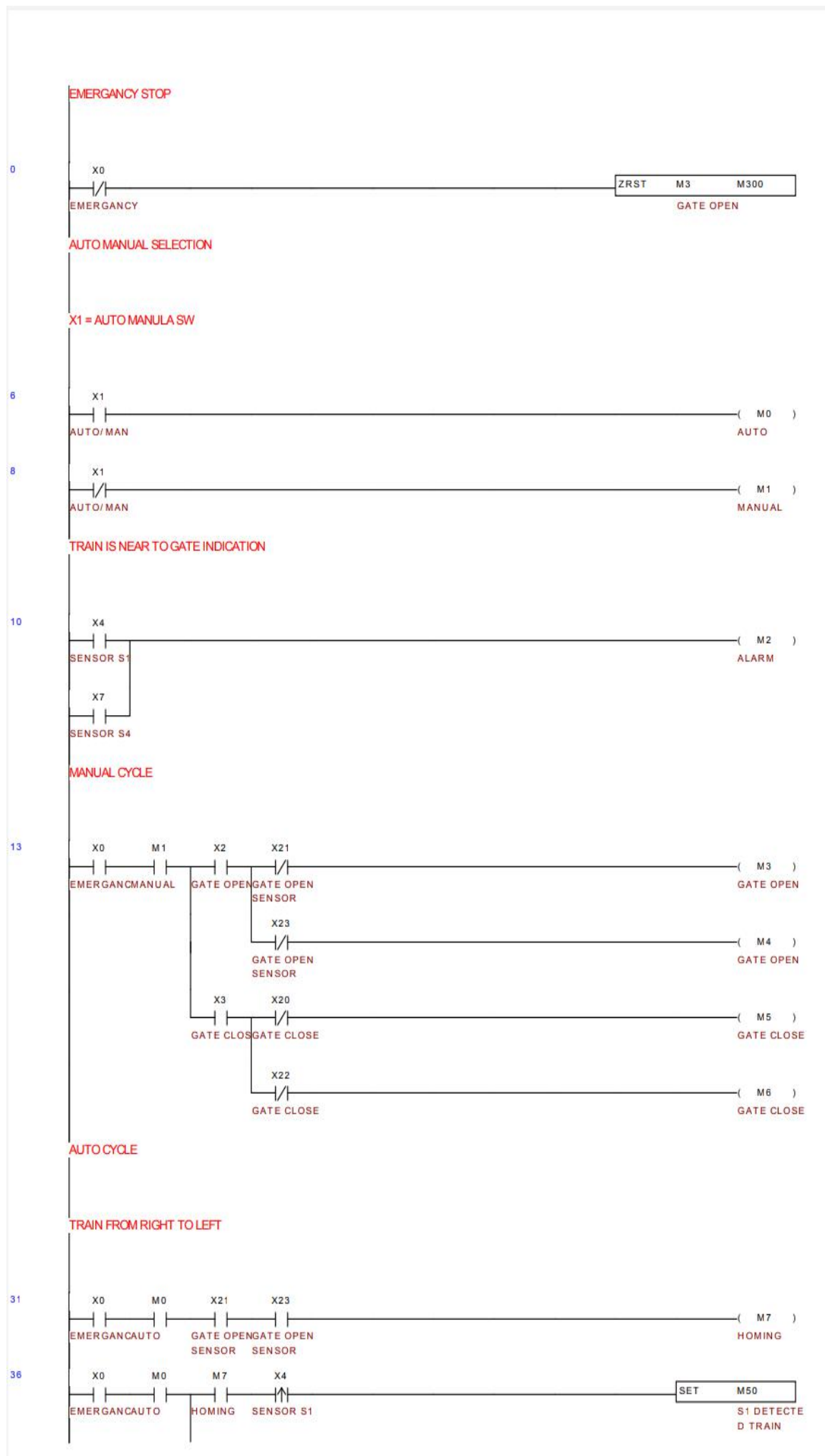


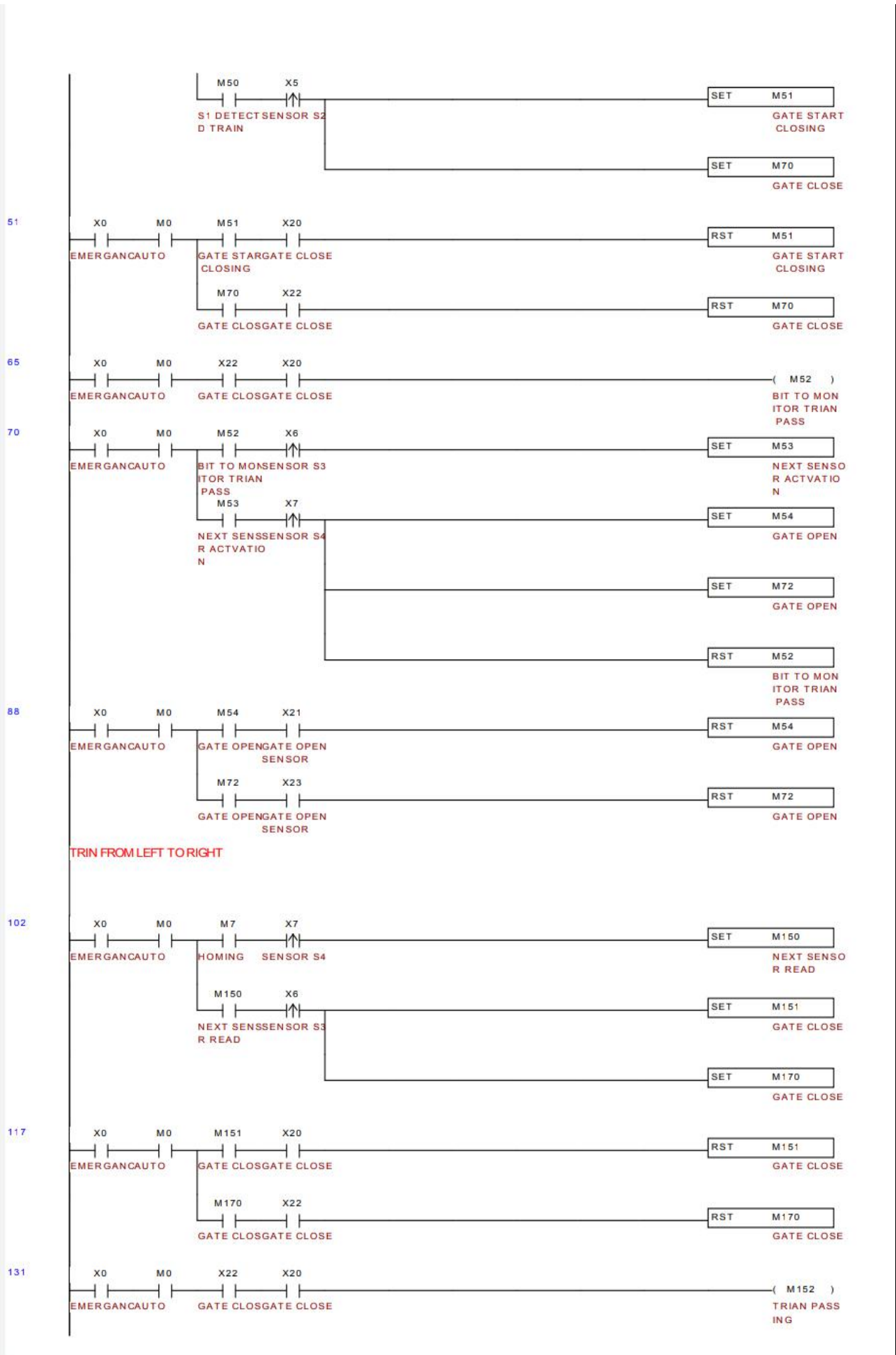
Fig.(c) . Train passed from sensor S4

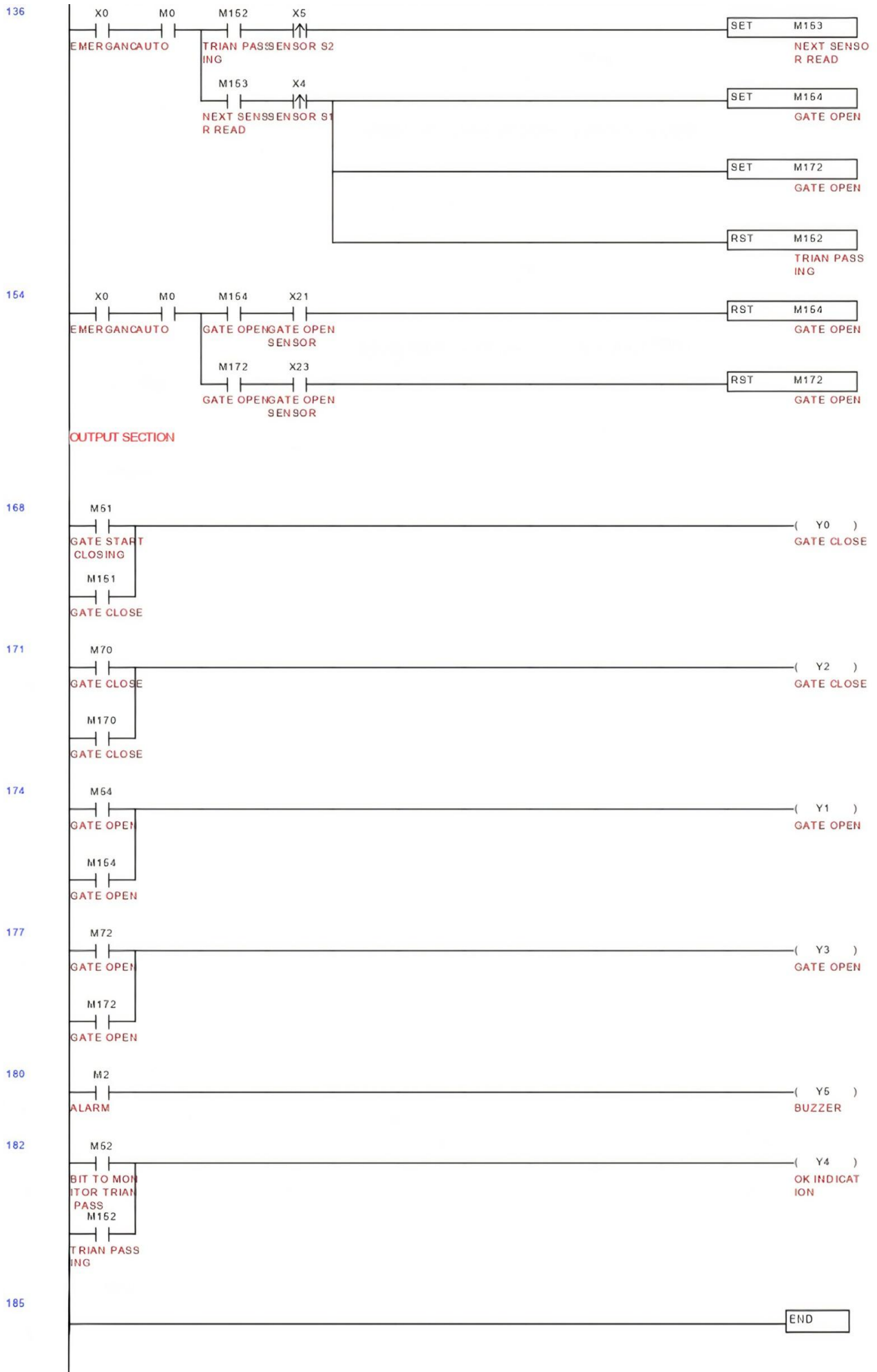
FLOWCHART



PLC LADDER DIAGRAM







#### ADVANTAGES

1. An Automatic Railway Gate Control is implemented with very simple hardware and easy control.
2. Human intervention at level crossings can be removed with the help of this project and many railway level crossing accidents can be prevented.
3. Automatic Railway Gate Control system reduce the time for which gate remains closed
4. Automatic operation prevents errors due to manual operation.
5. No human resource is required. This makes its running cost very low compared to manned gates.

#### APPLICATION

1. Real Time Transport System.
2. Railways
3. Industries
4. Schools and College junctions

#### IV. CONCLUSION

The injuries may be averted as much as a notable volume and additionally the human useful resource that become formerly used to simply near and open the gate is moreover changed with the aid of using PLC primarily based totally railway gate controller and impediment detector. Here we used DC cars to open and near the gates mechanically with the aid of using its rotation in anticlockwise and clockwise instructions respectively. Whenever the train arrives from a particular route the proximity sensor gives the sign to PLC and it generates a suitable sign for the operation of DC motor to near/open the gate. PLC sends working sign to the dc cars in line with the output sign of sensors to open/near the railway crossing gate. In our project, we used impediment detector transfer which saves the life of impediment, so protection is increases. A prototype street and rail line version with railway gate were created and enforced inside the laboratory. After a hit laboratory checking out of the whole system, it become observed that the advanced system operates satisfactorily.

#### V. ACKNOWLEDGEMENT

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