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AUTOMATIC E-CHALLAN GENERATION FOR TRAFFIC VIOLATION

Avinash Shinde[1], Rounak Sathe[1], Prakash Sutar[1], Prof.R.Sadakale[2]

Student[1], Professor, E&TC AISSMS Institute of Information Technology, Pune, Maharashtra, India[2]

Abstract- *Automatic E-challan generation for traffic violation is a PLC based project. The purpose of this project is to control the traffic violations by accurately penalizing the traffic violators. This will minimize the work of traffic police. This project is useful for controlling two types of traffic violations 1.Traffic signal violations.2.Toll-collection lane rule violation. In the first stage the vehicles that run a red light will be identified using a RFID reader. The RFID reader will input the PLC by scanning the tag placed on the vehicles. The database will be created in the program. When the RFID scanner inputs the vehicle, the PLC will immediately compare the barcode detected with the inputs fed into the database. In the second stage the vehicles breaking the toll-collection line rules will be correctly detected. Similarly like the first stage the comparison will be started with the data inputted in the database. The database will have the details of the vehicle.*

KEYWORDS: *- BECKHOFF; TwinCAT; RFID; Penalty; Traffic Violation; real time violation.*

I. INTRODUCTION

Automatic E-challan generation for traffic violation is a PLC based project that will automatically detect the violating vehicles and accurately punish them. This project is designed to reduce the work of traffic police officers so that they can focus on other violations like illegal parking, driving on the wrong side and drunk driving. This project will work in order to reduce the violations and make the city a better and a safe place for pedestrians and vehicles. The need for automation comes from the growing number of vehicles on the road every day. It has become an impossible task for traffic police officers to watch and control every road and every vehicle. It is up to the human beings to maintain discipline but in a densely populated country like India patience runs thin and forces the people to break the law. This project when fully functional is more suitable for practical purposes as a single PLC which may have input-output capacity of over 1 lakh can cover an entire city. When the drivers know that there is a constant check on their driving, they will automatically start obeying traffic rules. This project can easily cover an entire city. With a one-time investment cost, this project can be easily financed and supported by the government. The project will also be easy to implemented and cheap to maintain. The PLC can be centrally controlled. The PLC is a rugged processor that can handle rugged weather.The tag range varies hence they have to be selected as per requirement. The tag can be made compulsory to the car manufacturer; hence this will help in standardizing the tagging process of all new cars. Also the current vehicles which do not have tags will be given a deadline by the government. This project can only be successfully implemented with the active cooperation of the government, as the processes include compulsion on the people. This process is already installed in lots of developed countries but they have high speed, high cost cameras. Installing such high speed cameras at every junction is not possible. Hence this project is can remove the high cost cameras and replace them with low cost, efficient cameras.

II. SYSTEM ARCHITECTURE

A. Description of Block Diagram

A 24 V DC power supply is given to the PLC. The RFID scanner and the lamps are connected to the PLC. When one of the red lamp is on, the RFID scanner corresponding to that red lamp will also simultaneously turn on. The RFID scanner will detect a tag if the vehicle violates the red light. The RFID scanner output is thus given to the controller input. The controller will then compare this tag with the database and identify and enter the violator details into the program.

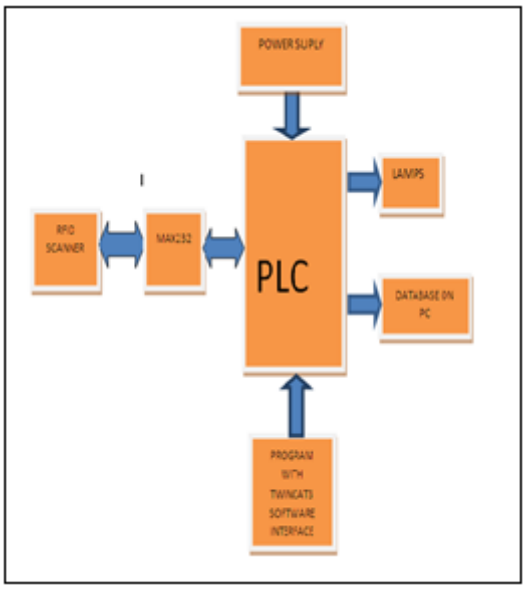

Fig.2.1 Automatic E-challan generation for traffic violation

CONNECTION DIAGRAM

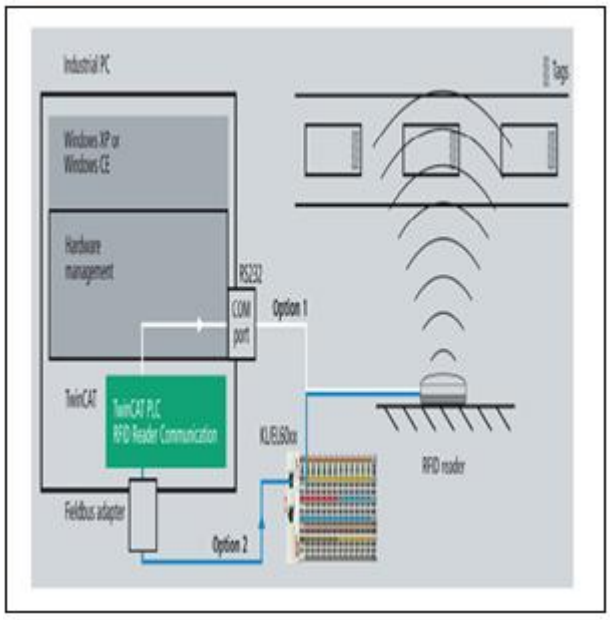

Fig.2.2Connection diagram

B. Hardware Design

1. PLC module

- The CX9020 is a compact, DIN rail-mountable Ethernet control system with 1 GHz ARM Cortex™-A8 CPU.
- The connection for the Beckhoff I/O systems is directly integrated into the CPU module. The unit offers automatic bus system identification (K-bus or E-bus) and independently switches in the corresponding mode.
- The CX9020 comprises the CPU with two microSD card slots, the internal RAM and 128kB NOVRAM as non-volatile memory
- TwinCAT automation software transforms a CX9020 system into a powerful PLC and Motion Control system that can be operated with or without visualisation.

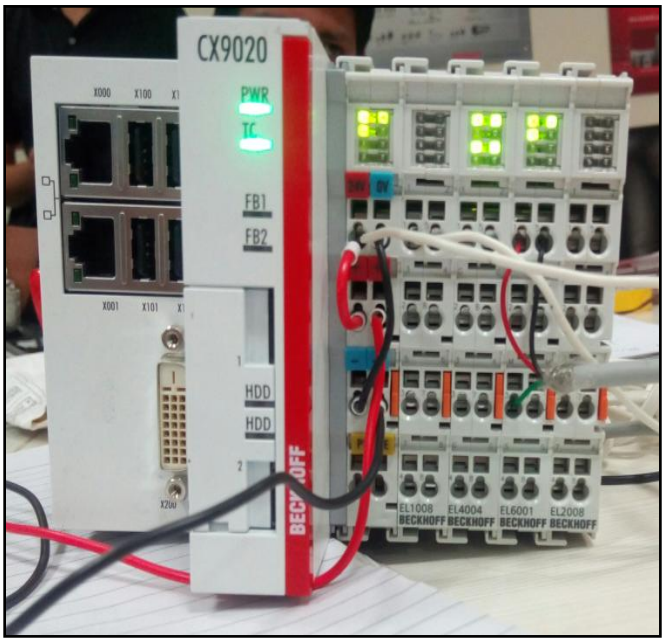

Fig.2.3PLC module

2. EM18 RFID module

Fig.2.3EM18 reader module

The RFID scanner is a component which is used in both input and output activities of the PLC. The RFID scanner will first be activated by the PLC when the output is a red signal. Thus it will act as a scanner. When it senses the vehicles it will detect the barcode placed on the vehicles. Thus it will now act as an input. The RFID is connected to the PLC and the PLC will receive the output of the RFID scanner. The output will be containing the complete information regarding the vehicle number, owner information, type of vehicle. The RFID communicates through serial communication and is connected to the PLC using the RS232 port.

C. Software Design

The software used is the TwinCAT 3/2, which is developed by the BECKHOFF automation. Pvt .Ltd. This software is used to interface to the PLC which is also developed by the same company. The TwinCAT is programming software and the programming can be done in ladder language or C/C++. The TwinCAT software also has a visualization function which enables us to view the entire working of the hardware on the screen. This feature is very important for testing purposes or in environments where conditions are hazardous for human working. This software thus allows doing the programming and also carrying out interfacing of the hardware components with the PLC.

Fig.2.3TwinCAT 3

- TwinCAT 3 highlights
- only one software for programming and configuration
- Visual Studio integration
- more freedom in selecting programming languages
- use of C/C++ as the programming language for real time applications
- open interfaces for expandability and adaptation to the tools landscape
- flexible runtime environment
- active support of multi-core and 64-bit systems
- migration of TwinCAT 2 projects
- automatic code generation and project implementation with the TwinCAT Automation Interface
- extended real-time-functionality: min. 50 cycle time and low jitter

Flowchart

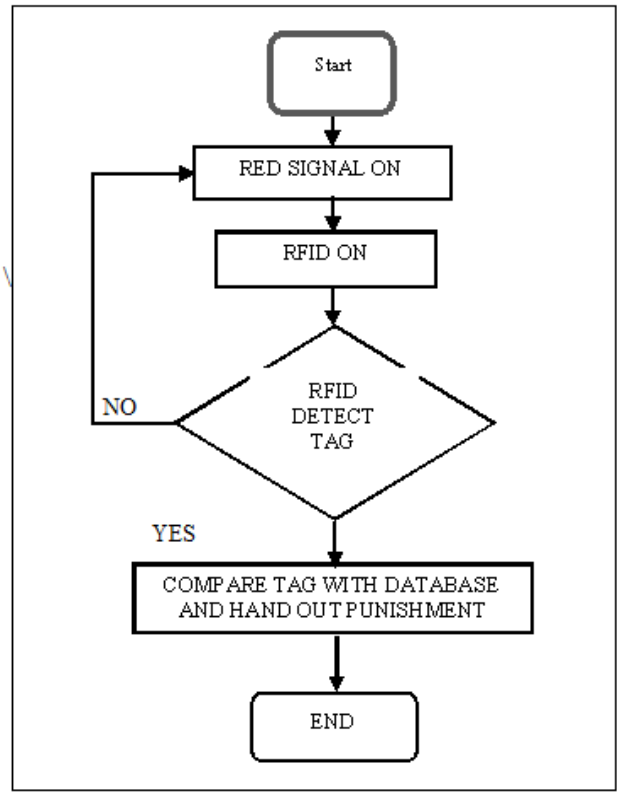

Fig.2.4Flowchart

EXPECTED RESULT

It can be expected that automatic E-challan generation using RFID scanner should provide efficient system capable of conserving resources and human effort.
The system also facilitates real-time remote monitoring of the current traffic situation.
The system will also be able to add on additional traffic signal junctions easily.

CONCLUSION

We can thus conclude that the interfacing of the PLC module and RFID is successfully done.
Real rime monitoring using PLC on a PC or laptop.
This will reduce the efforts of traffic police officers and help them focus on other violations like drunk driving, lane cutting, over speeding.

FUTURE SCOPE

This project has the potential to automate many more violations like illegal parking, lane cutting at certain intervals.

REFERENCES

[1].Nourdine Aliane *, Javier Fernandez †, Mario Mata † and Sergio Bemposta †A System for Traffic Violation Detection*Sensors* 2014, *14*, 22113-22127; doi: 10.3390/s141122113

[2]. Rana Biswas, Romit S. Beed, Dibyabiva Seth, Proyag Pal, Kaustav Basu, Triparna Mukherjee," Traffic Rule Violation Information System TRuVIS", Volume 5, Issue 7, July 2015

[3].Aditi Dambe1, Upasana Gandhe2, Varsha Bendre3AUTOMATIC PENALTY CHARGINGFOR VIOLATION OF TRAFFIC RULES International Journal of Advanced Research in Electrical, Electronics and Instrumentation EngineeringVol. 2, Issue 2, February 2013.

[4].L. Fowle, User Evaluation of a Barcode Reader for Visually Impaired People: Results and Discussion, 1995, Royal National Institute for the Blind.

[5]. Mandeep Kaur, Manjeet Sandhu, Neeraj Mohan and Parvinder S. Sandhu. RFID Technology Principles, Advantages, Limitations & Its Applications International Journal of Computer and Electrical Engineering, Vol.3, No.1, February, 2011 1793-8163.

[6]. Sumita Nainan, Romin Parekh, Tanvi, RFID Technology Based Attendance Management System, IJCSI International Journal of Computer Science Issues, Vol. 10, Issue 1, No 1, January 2013

[7]. Prof. Burali Y. N, PLC Based automatic traffic Automation & Monitoring, RESEARCH INVENTY: International Journal of Engineering and Science ISSN: 2278-4721, Vol. 1, Issue 3 (Sept 2012), PP 01-04

