

Safe and Efficient Transport System using PLC and SCADA

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Abstract— Safe and efficient Rapid Transit systems of bus are becoming more popular in congested cities around the world. This project reviews features of safe and efficient transport system. This project recommends sets of features like safety at cross road when the bus is coming, passenger counting, bus frequency calculation and bus tracking on each station. Features of this system have been implemented with the use of PLC and SCADA. All the sensors have been connected to PLC I/O modules and SCADA provides trend and remote monitoring feature.

Index Terms—Transport system, PLC overview, SCADA, communication of PLC and SCADA

I. SYSTEM INTRODUCTION

Safe and efficient transport system provides multiple features like passenger counting, bus tracker, hooter indication at cross road, bus frequency calculate and adjust [1]. This simulation has been done with the help of programmable logic controller (PLC) and supervisory control and data acquisition system. A Programmable Logic Controller (PLC) is an industrial computer control system that continuously monitors the state of input and output to take the necessary action depending upon the condition has been made in ladder programming. But the biggest benefit in using a PLC is the ability to change and modify the program easily, less wiring, and easy trouble shooting. [2]SCADA stands for supervisory control and data acquisition mainly for remote system monitoring and controlling. SCADA provides multiple windows, chart, alarm handling feature and trends.

II. SYSTEM DESCRIPTION AND RESULTS

In this prototype of the safe and efficient transport system proximity sensor has been used for the detection of the bus. Proximity Sensor includes all sensors that perform non-contact detection in comparison to sensors, such as limit switches, that detect objects by physically contacting them. Proximity Sensors convert information on the movement of an object into an electrical signal. When the sensor detect the bus led will glow at station 1 and in the SCADA it will show the indication on the other station. The communication between PLC and SCADA has been done with the help of DDE OPC server. [3] Following features have been implemented in the system.

- Bus tracker on each stands
- Passenger counting and capacity control
- Priority at cross road and hooter indication
- Historical trend

1. Bus tracker on each stands

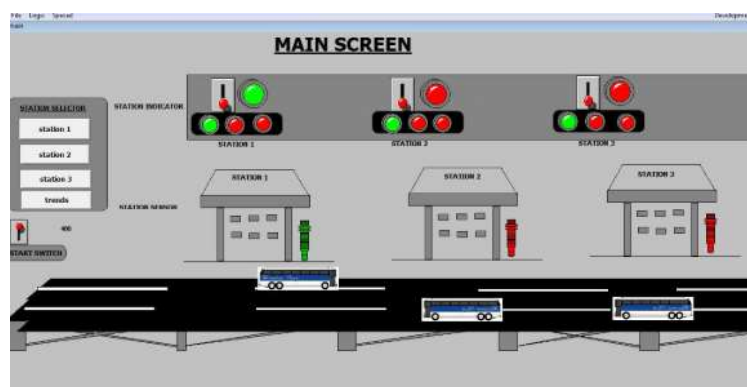


Fig -1 Screen shot of BUS TRACKING using SCADA

For bus tracking on each and every bus stand we are going to provide proximity sensor at each And every bus stand. So, when bus comes at station sensor is activated. It may also activate the Bus indicator. Here in below figure the screen shot of the bus indicator using SCADA.

Process steps:

1. Bus arrived at station.
2. Sensor senses the bus.
3. Contact is being closed.
4. Indicator goes on at each and every station and indicates at which bus stand the bus is.

2. Passenger Counting and Overflow Indication

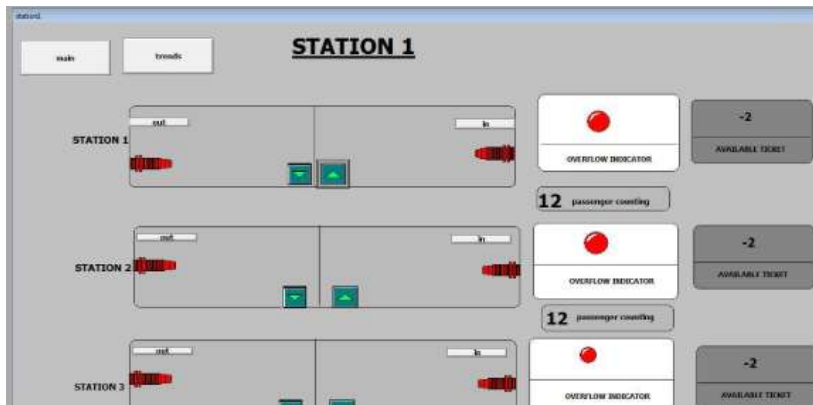


Fig -2 Screen shot of SCADA for Passenger Counting and Overloading Indicator

Using counter and proximity sensor we can count the number of passengers in bus. We are going to place the proximity sensor at the both door of the bus. Using this signals counter may go up or down. And we can count the number of passenger in bus. We can also control the number of passengers in bus by pre-setting maximum numbers of passengers we can control the number of passengers. Here for example we take the Capacity of bus is 10. So when the number of passenger is 10 then the overloading light is being activated.

Process Steps:

1. Passenger goes in from IN door of bus.
2. Sensor gets the pulse and being activated.
3. It will increase the accumulator value of Counter.
4. Now when passenger leaves the bus it will increase the accumulator value of counter.
5. When the number of passenger in bug goes above the pre-settled value “overflow Indicator” goes ON.

3. Priority at cross road and hooter indication

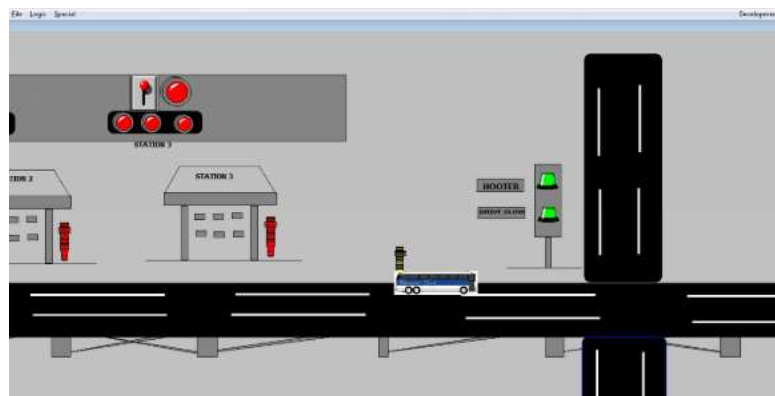


Fig -3 Screen shot of SCADA for When Bus is near to cross road indication

A sensor placed before the cross road or elsewhere needed, now when sensor sense the bus it will enable hooter. So citizens who are on other track are having informed that the bus is coming. When the sensor placed at fixed place near to the cross road or elsewhere this safety is needed. Now when this sensor gets pulse, hooter will gate signal and indicates that the bus is coming so we can reduce the accidentals problems

4. Historical trends

Using Historical Trends we can get Real Time Information of passengers in the bus and we can use this for offline analysis of system and passenger flow. So using this we can provide better transport system to the society.

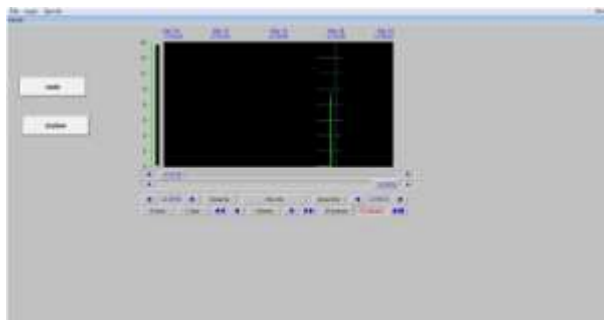


Fig -4Screen shot of SCADA for Historical Trends

III. CONCLUSION

Safe and efficient transport system provides features of passenger counting and capacity control, bus tracker on each bus stand, and hooter indication at cross road. Passenger counting feature can be helped to evaluate the frequency of the bus. This features can be used to make the transport system more efficient.

IV. REFERENCES

- [1] Jishnu Gohel, "A Comprehensive Review of BRT System Introduced in Ahmedabad," 2014 IJEDR | Volume 3, Issue 1
- [2] Akhil Dixit , Rahul Mendiratta , Tripti Chaudhary , Naresh Kumari, "Review Paper on PLC & Its Applications in Automation Plants," International Journal of Enhanced Research in Science Technology & Engineering, Vol. 4 Issue 3, March-2015
- [3] Priyank Patel, Darpan Trivedi, Deep Savsani, Shriji Gandhi, "Automation in Urban Drinking Water Filtration, Supply Control & Water Theft Indication Using PLC & SCADA," 2016 IJEDR | Volume 4, Issue 2