

DESIGN AND IMPLEMENTATION OF LABELLING MACHINE SCREEN DEVELOPMENT USING SCADA

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ABSTRACT:Automation of many different processes, such as controlling machines or factory assembly lines, is done through the use of microcomputerfunctioning as Programmable Logic Controller (PLC). PLC is a control device that consists of a programmable microprocessor, and is programmed using a specialized computer language. With the application ofSCADA(Supervisory Control and Data Acquisition) and PLC System this paper represents the labelling process which carried out in industry which can be visualized on single screen developed on the SCADA.

Key words: PLC, SCADA ,Labelling Machine

Introduction:With the development of industry and more complex manufacturing processes, management of modern industrial plants is unthinkable without the help of modern monitoring systems or SCADA (Supervisory Control and Data Acquisition) designed for full supervision, better control and greater reliability in the production processes. These systems are present in all branches of the economy, but mostly in the process industry, energy, telecommunications, oil and gas industry, transportation, etc. Surveillance or monitoring of the plants, as the basic function of SCADA systems, uses communication protocols and a graphical user bond to present data for the state of

the system to the end users or operators and provide a clearer image of the process. Most modern PLC's can communicate over a network to some other system, such as a computer running SCADA system.

SCADA Elements: There are four major elements to a SCADA system which are

- Master Terminal Unit (MTU)
- Communications
- Remote terminal unit (RTU)
- Video Display Unit(VDU)

The operator exercises control through information that is depicted on a video display unit (VDU). Input to the system normally initiates from the operator via the master terminal unit's keyboard. The MTU monitors information from remote sites and displays information for the operator. The relationship between MTU and RTU is analogous to master and slave. SCADA systems are capable of communicating using a wide variety of media such as fibre optics, dial-up, or dedicated voice grade telephone lines, or radio.

- **Master Terminal Unit:-**The master terminal unit initiates all communications, gathers data, stores information, sends information to other systems, and interfaces with operators. The major difference between the MTU and RTU is that the MTU initiates virtually all communications by its programming and people. Almost all communication is initiated by the MTU. The MTU also communicates with other peripheral devices in the facility

like monitors, printers or other information systems. The primary interface to the operator is the monitor that portrays a representation of valves, pumps, etc. As incoming data changes the screen is updated.

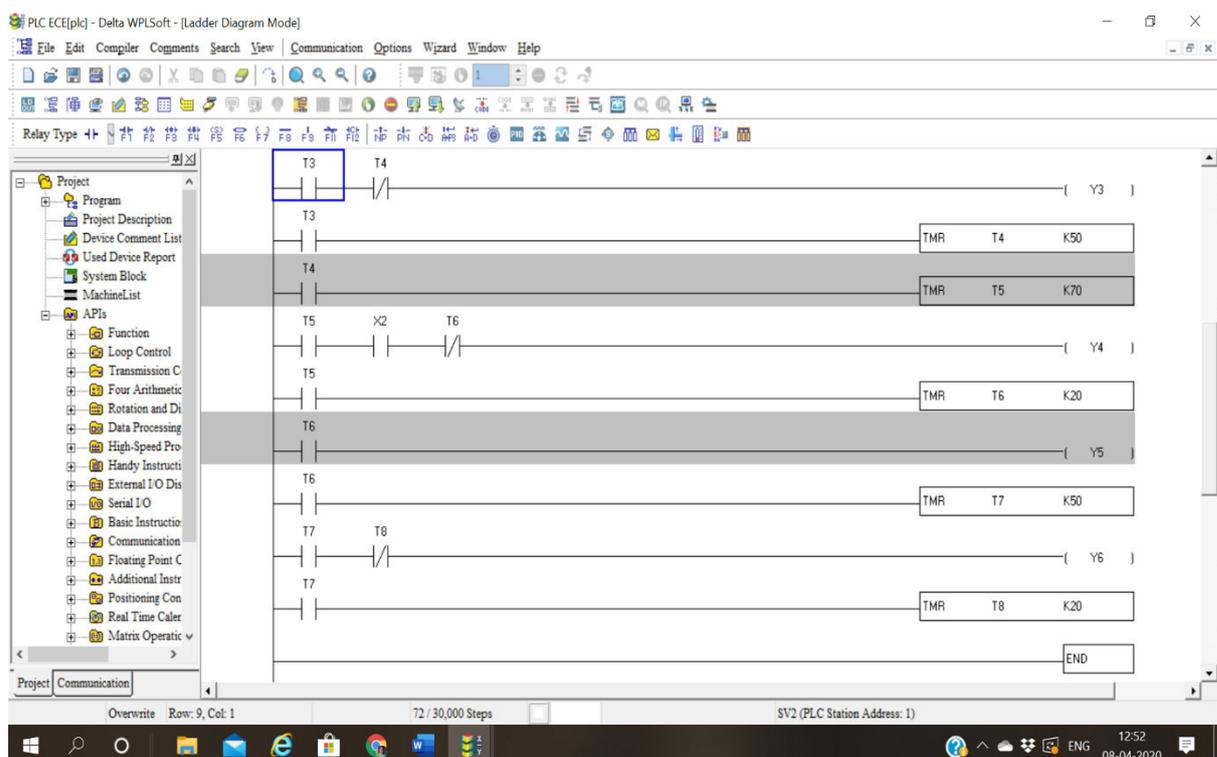
- **Remote Terminal Unit:-** Remote terminal units gather information from their remote site from various input devices, like valves, pumps, alarms, sensors, meters, etc. Essentially, data is either analog (real numbers), digital (on/off), or pulse data (e.g., counting revolutions of meters).

Many remote terminal units hold the information gathered in their memory and wait for a request from the MTU to transmit the data. Other more sophisticated remote terminal units have microcomputers and PLC that perform direct control over a remote site without the direction of the MTU. The RTU central processing unit receives a binary data stream in accordance with the communication protocol. Protocols can be open, like Transmission Control Protocol and Internet

PLC Programming Interfaced to SCADA:

- The PLC programming implemented is in Ladder Logic Diagram

Fig: PLC Programming with memorycoil



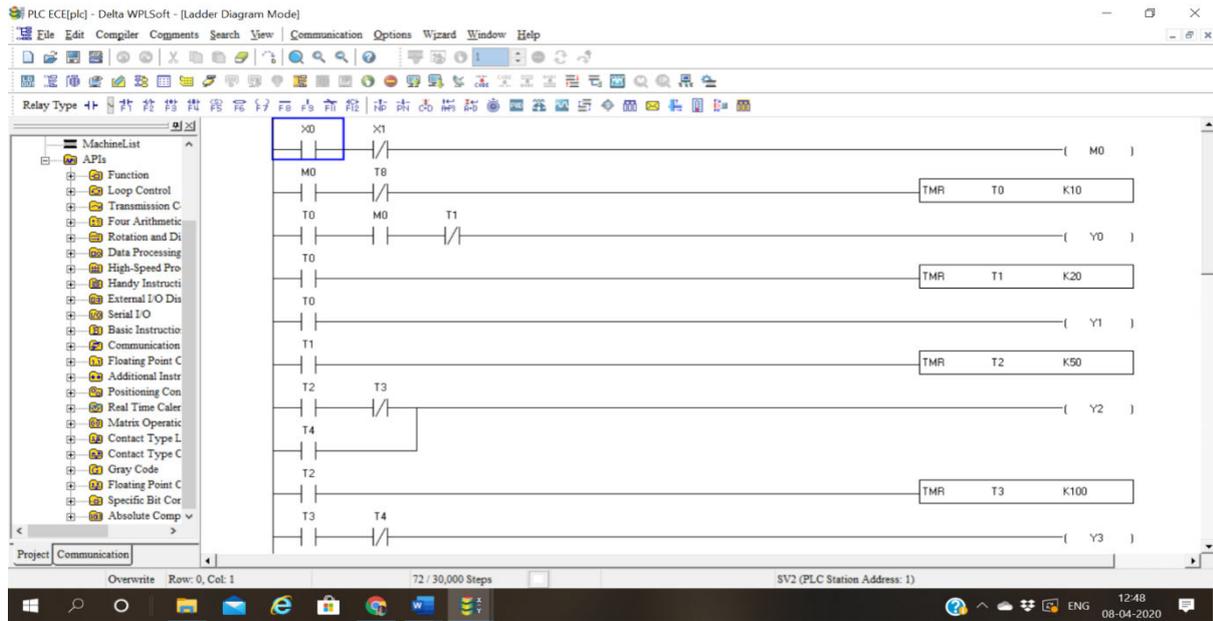


Fig: Plc Programming for Automation to Scada

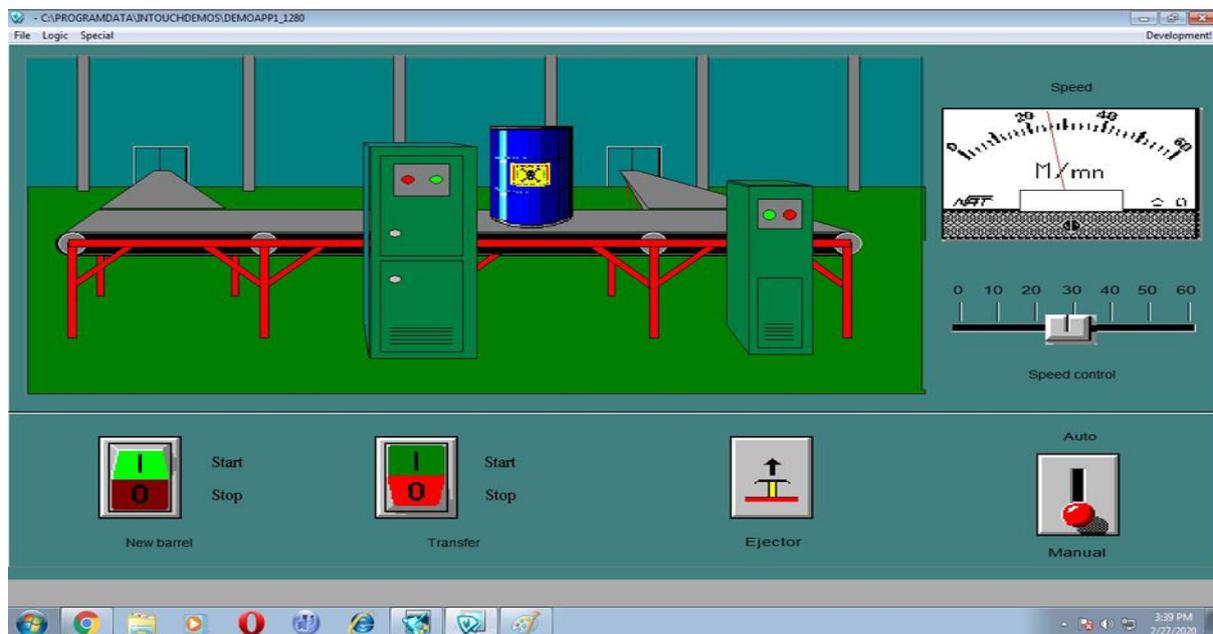
Simulated Results:-

Simulation In Manual Mode :

The Screen Developed in SCADA Wonderware Intouch software can be operated in two modes which is Automatic mode and Manual Mode. here, the operation is simulated in Manual mode

- When you see the screen , there is a barrel moving on the conveyor belt

Fig :Speed control in manual mode using slider



- When the Labelling process is completed then the Ejector pushes the barrel using the Ejector switch and if the ejector doesn't operate then the barrel gets damaged and a message is displayed on the Screen .

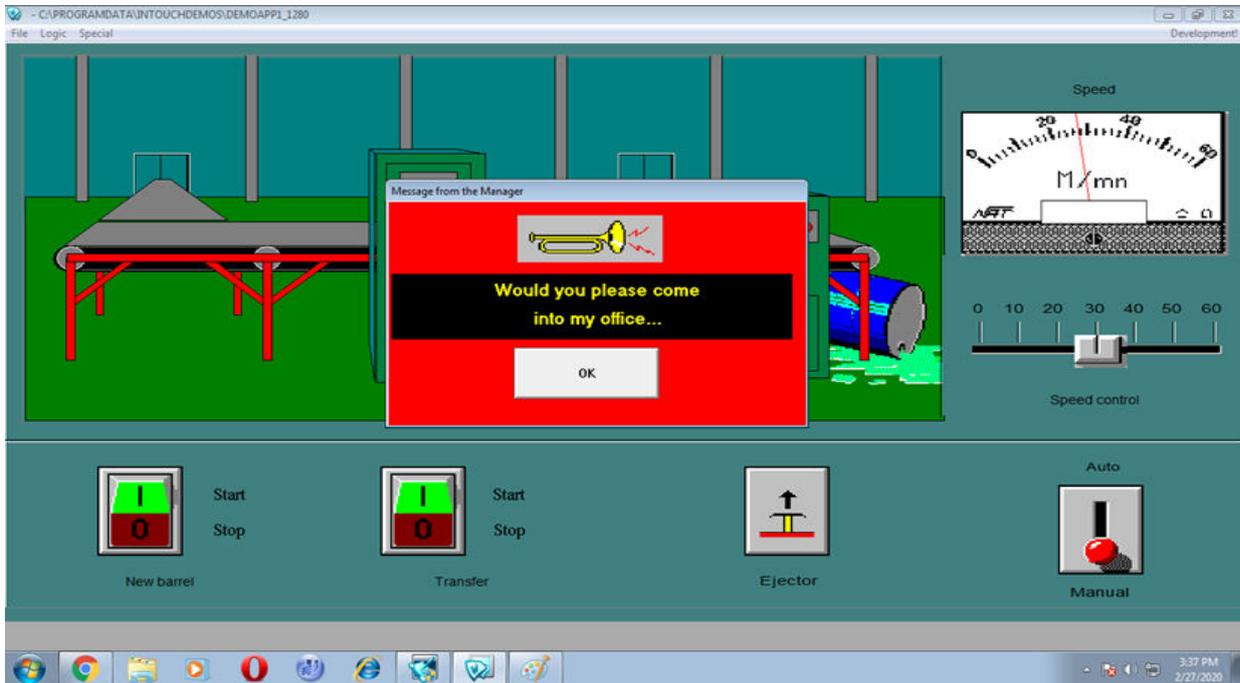


Fig : Error message displayed on the Screen

SIMULATION IN AUTOMATIC MODE:

To overcome this damage to the barrel the Automatic mode is implemented such that the process is always continued without causing the damage to the barrel.

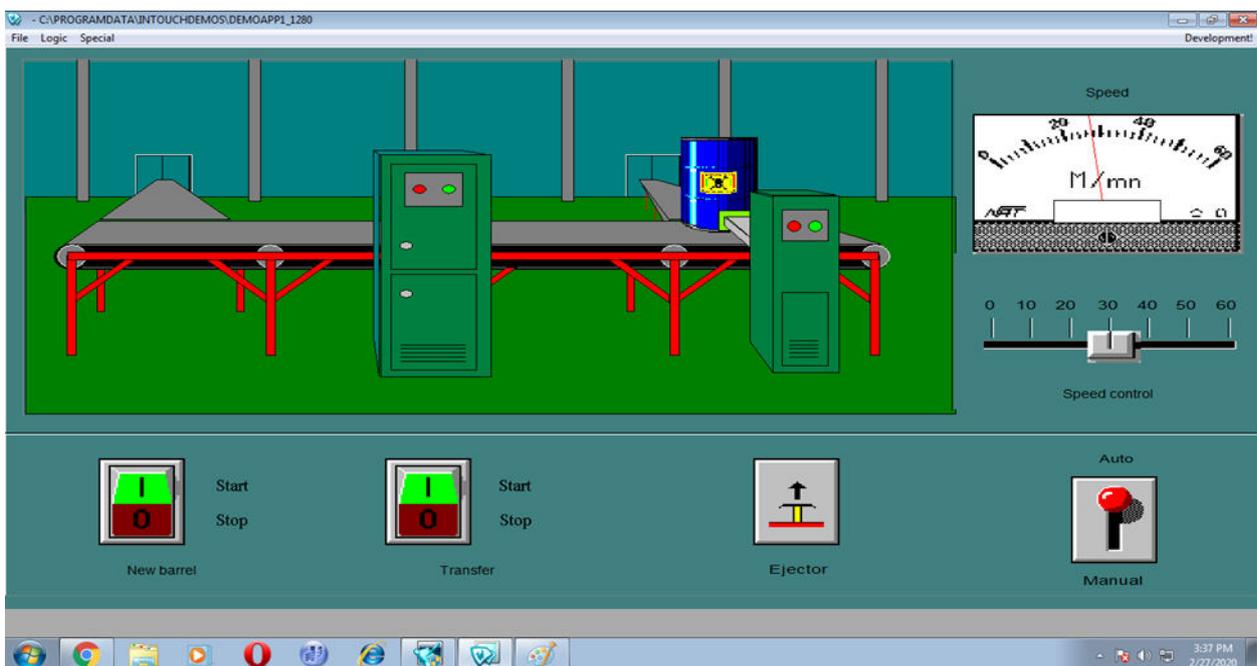


Fig: Ejector operation in Automatic mode

- The speed of the barrel moving on the conveyor is operated using Slider in Automatic mode

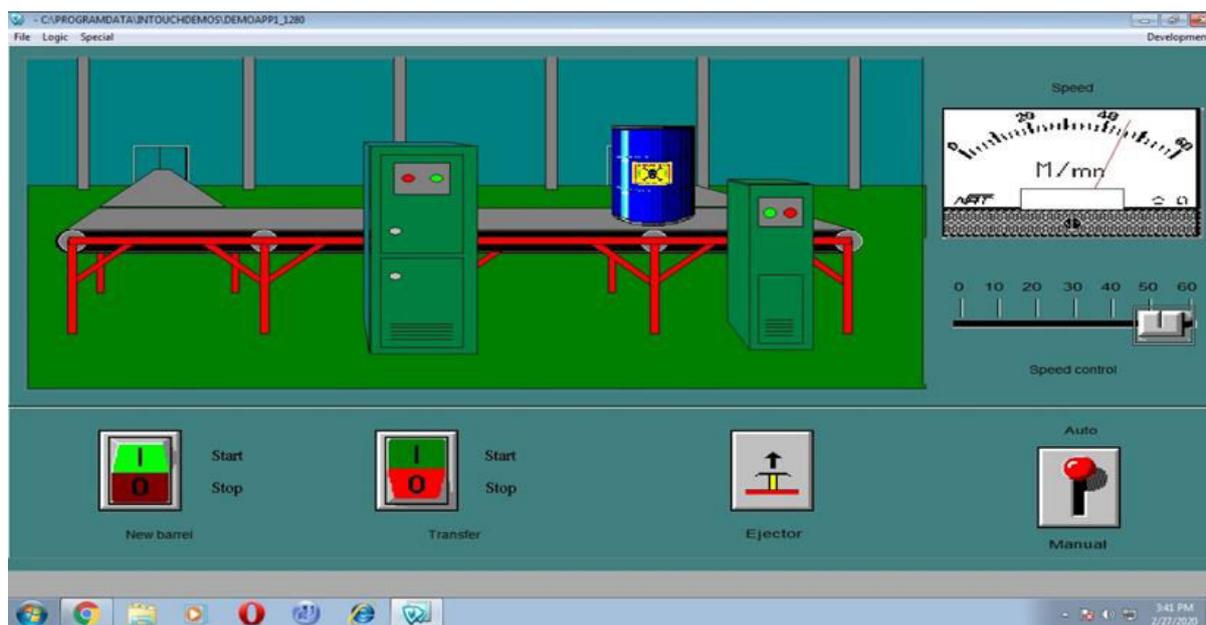


Fig :Speed control using Slider

Conclusion :

The designed SCADA is commensurate to: A real-time view of the industrial plant; reduction in the troubleshooting time for faults; and safety of operating personnel. Manufacturing industries can easily adapt to the implementation of SCADA as part of their industrial automation systems to make process visualization of the plant easier, locate faults rapidly and to help replace humans in tasks done in dangerous environments.

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