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Approach of RS Logix 500 Programming Software to Design PLC Based Process Controlling

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ABSTRACT
Automation controls the processes without inputs from the user or with less human assistance. Automation provides the faster output and simplified solution to any task or process to be controlled. With the help of automation one can easily operate electrical and mechanical devices automatically. Quality improvement, errorless process, increased production, safe environment, increment in efficiency etc are some of the aspects behind the implementation of automation. Now a days the small and simple as well as large and complex applications or processes are also controlled automatically. To control the various processes, a programmable logic controller (PLC) is the tool used in an industry.There are number of companies in the market which makes the programmable logic controllers. The Allen Bradley PLC is one of the most popular names in PLCs available in the market. To program a particular PLC, a particular software is used. In this paper an attempt is made cover some programs ideas to control the process operation using RS Logix 500 programming software used for Allen Bradley Micrologix 1400 series PLC.
Keywords – RS Logix 500 PLC Programming Software, PLC, Inputs (switches, sensors), Outputs (Electrical Devices, mechanical devices, Indicators), Personal computer etc

Introduction

As the various PLC based applications requires the controlling of processes or devices as per the need of operation, the one must have the basic knowledge of ladder programming. Here the aspect of process controlling is done with the Allen Bradley Micrologix 1400 series PLC and RS Logix 500 programming software. The communication software used is RSLinx Classic. The ladder logic programming of any process or task is depends on the particular sequence of operation in which the application has to run. A PLC takes the signals from inputs and control the process or devices as per the ladder program written for particular operation. To make a ladder program for particular process, the knowledge of various components, symbols, their work and use is an essential part. The paper includes some basic process control operations to understand the use of RS Logix 500 programming software to design some basic ladder programs as per the various conditions of operations.

Automation Design Process

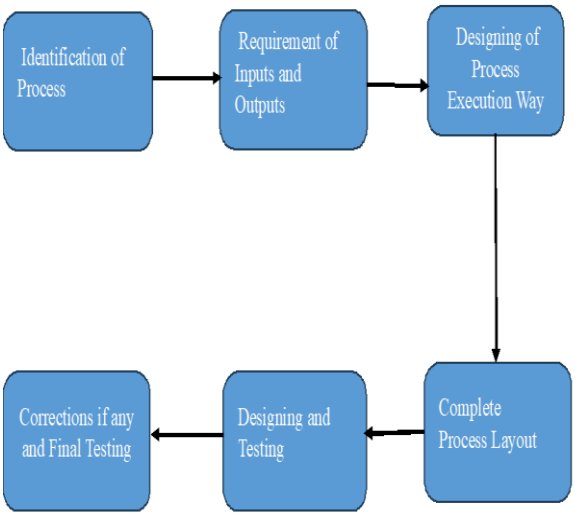


Fig 1.1

Experimental Work

(A) General Connection Diagram with Relay Board

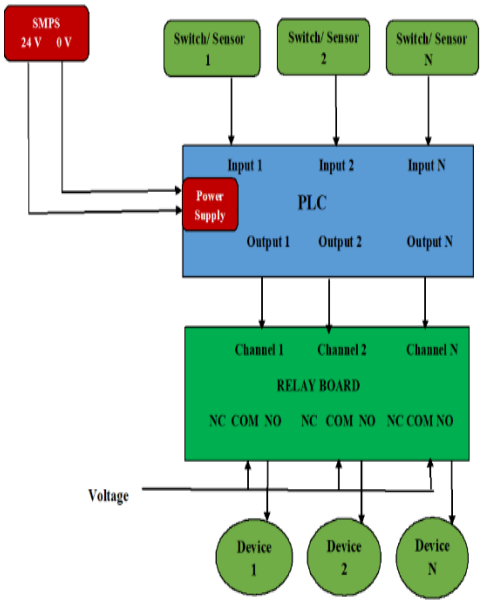


Fig 1.2

(B) General Connection Diagram with Relay and Contactor

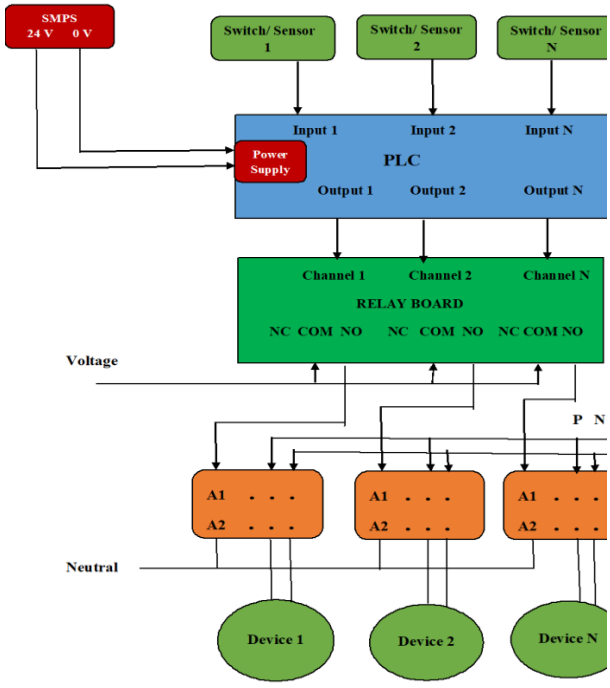
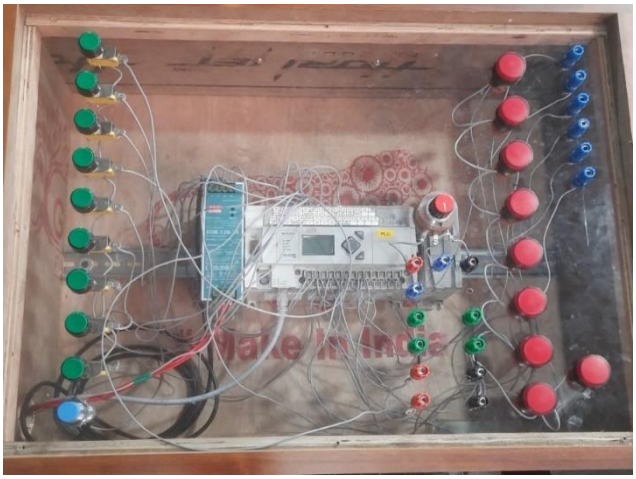


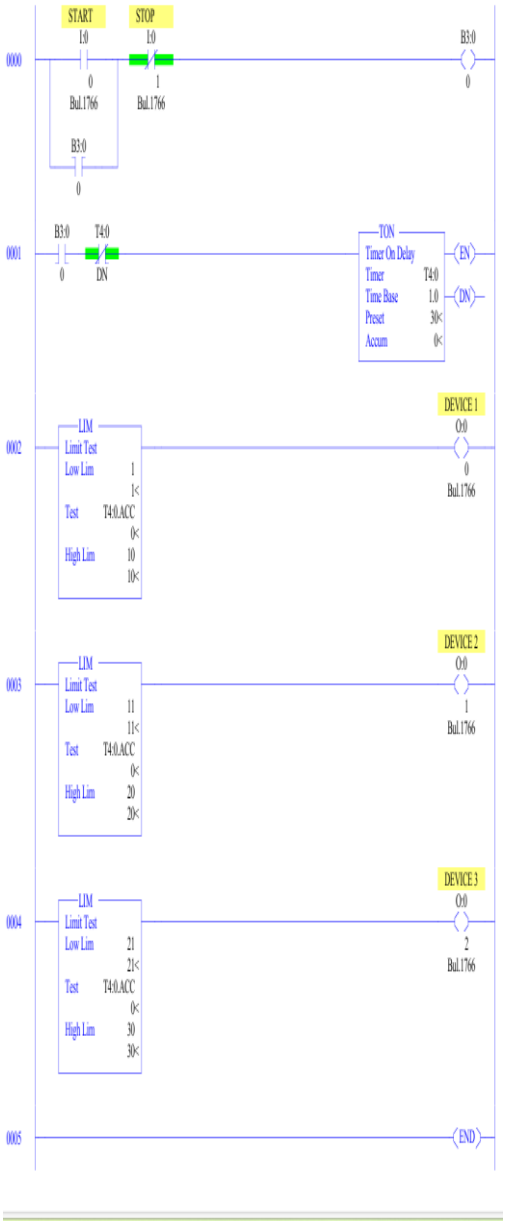
Fig 1.3

(C) PLC Based Control Panel

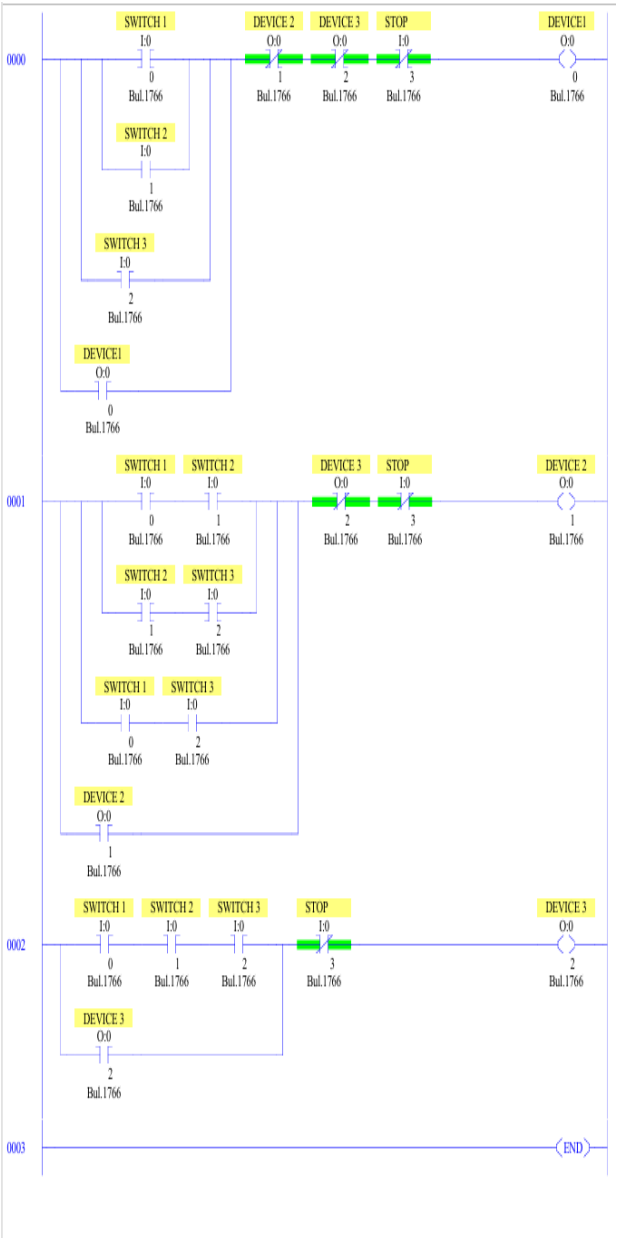


(A) Ladder Program

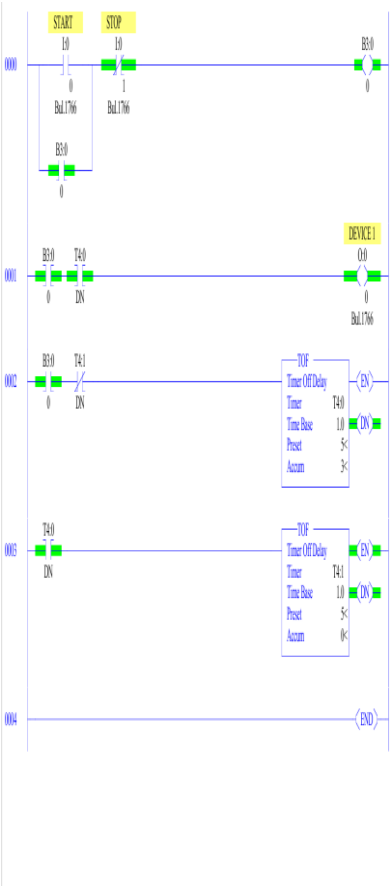
(1) 3 Devices will be ON for a particular duration of Time one by one

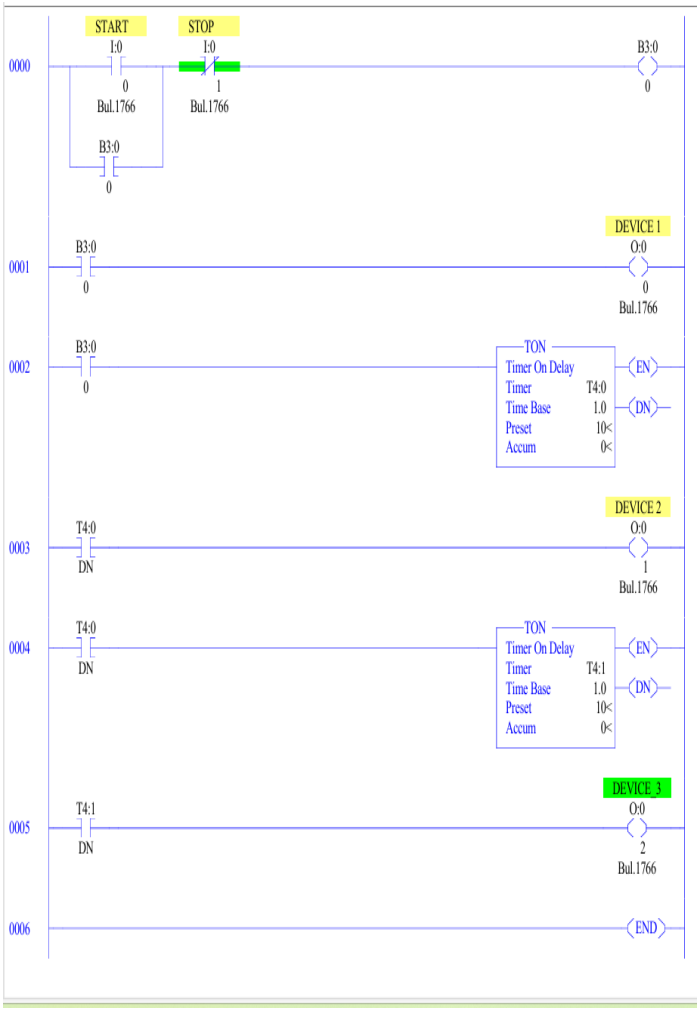


(2) Switches Condition Based Controlling Process



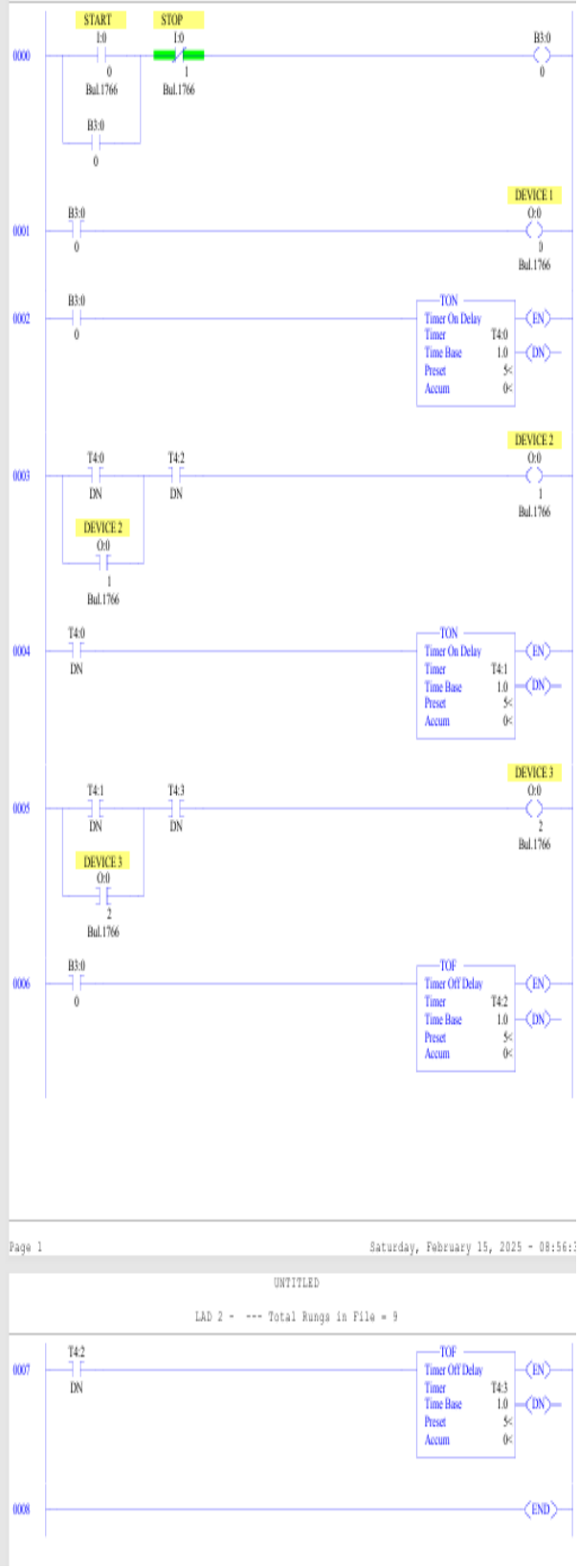
(3) Alternate ON and OFF Process.





(4) Switches and Timer Condition Based Process Controlling (Using TON Timer)

(5) Sequentially ON and Sequentially OFF (Using TON and TOFF Timer)



Outcome

- Low-cost automatic controlling of various processes is possible.
- The various processes or operation can be performed by changing ladder logic programs.
- Automatic control of process or operation Provides Safety in plant environment.
- Simple and small as well as large and complex processes can be handled easily.

Conclusion

The system monitors the process continuously as per the ladder program designed for particular operation and as per the various conditions mentioned in a program controlling of process or devices is done. So errorless operation is possible.

The designing of PLC based process controlling is easy to understand and design on Allen Bradley PLC with the use of RS Logix 500 software.

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