

## ABSTRACT

Programmable logic controller (PLC) is a device that digitally operated and has a memory that is used to store the instructions that will be executed, the PLC has input and output ports are used to connect to external devices such as sensors, switches, relays, contactor, etc..

PLC has been widely used in manufacturing systems for many years. In its application, the PLC programming required to support the software (software) and appropriate methods. Currently have found many different types and sizes PLC, the general method of programming using Ladder Logic Diagram (Ladder Diagram) which contains input - process - output. Meninjau usefulness of PLC in the manufacturing system, it is seen that the PLC devices require reliable performance, the performance in question is the speed and accuracy in the process control of industrial devices in the manufacturing system.

The final task of this time talking about the design and implementation of a simple PLC which has 8 digital inputs and 8 digital outputs. The PLC can be programmed using computer through a Universal Serial Bus (USB). See the urgency of the above is related to the speed and accuracy in processing data received from another device, this time in the design will implement the PLC device on board XuLA-200 in which there are Field Programmable Gate Array (FPGA) Xilinx<sup>®</sup> Spartan-3A XC3S200A, so the design is the result of a PLC device that can perform as PLC control with simple instructions in general but has a faster response than the existing PLC due to see the advantages of the FPGA that can make the process faster and are reconfigurable.

**Keywords: PLC, FPGA, Ladder Diagram, Spartan-3, XuLA-200.**