

ABSTRACT

Design and Construction of a Programmable
Logic Controller

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Programmable Logic Controllers (PLCs) are the latest advances in Engineering and Technology used for controlling the industrial environment. They are presently used to control machines and processes with an efficiency and accuracy never before achievable with conventional industrial relay based control systems.

In this thesis, a PLC was designed, constructed and used to control an industrial type sequencing activity. The design was first approached by constructing a minimal PLC system based on the 8085A microprocessor, a 6116LP-4 Random Access Memory Chip and an 8255A Programmable Peripheral Interface Input/Output chip. As a result of building this system a thorough knowledge was gained as to the design and operation of a PLC system.

The PLC system which was finally built was, however, based on the INTEL 8088 microprocessor. The system was equipped with digital I/O, an analog to digital converter (ADC), a digital to analog converter (DAC), a serial RS232 port through which it is

programmed, and a counter/timer for real time applications. With such an arrangement various application programs could be downloaded to the PLC from an attached IBM PC or compatible computer. The PLC, having received downloaded programs can then execute them and control manufacturing and industrial processes.

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