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AUTOMATION: PROGRAMMABLE CONTROLLER

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ABSTRACT

'AUTOMATION: PROGRAMMABLE CONTROLLER'

The development of microprocessor introduces Programmable Controller as a substitute for the electro-mechanical relay logic automation system. Most industrial processes require several operations to produce the required output. Thus, small size, reliable, flexible, simple programming and low cost programmable controller (PC) are used.

The design of PC is based on the MC 6802 CPU which performs the scanning of the inputs and traverses the stored program in the EPROM and/or RAM line by line and logically or arithmetically combines the inputs and outputs as specified by the program and determine the appropriate output.

The programmer consists of several special function keys where ladder diagram and mnemonic programming language is used to program the PC. The I/O module provide the link between the controller and the process equipment/device to be controlled.

The input interface provides the isolation between the equipment which includes pushbutton, limit swiches, sensors and optocoupler as an input conditioners and convert the input signal to a form acceptable to the controller. The output interface convert PC signal to a form which can be used by the process equipment through optocouplers.

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1.1 GENERAL

A programmable controller (PC) is defined by the US National Electrical Manufacturers Association as

'A digitally operating electronic apparatus which uses a programmable memory for the internal storage of instructions for implementing specific functions such as logic, sequencing, timing, counting and arithmetic to control, through digital or analog input/output modules, various types of machines or processes'.

This is a fairly wide definition for a very specific range of instruments that have only been around since the late 1960's, but which are used in almost every field of manufacturing industry.

Introduces as a substitute for electro-mechanical-relay-logic systems, the PC comprises the following basic components: input/output interfaces, processor, memory, programming device. This will be discussed in more detailed in chapter two. The implementation of PC which based on digital principles and devices in industries with the reason of its efficient, reliable, flexible; and in many cases, cheaper than existing analog equipment. Couple with the ability to interconnect digital equipment in the plant with the central computer back at the office, one will have a factory which is efficient and economical to run, monitoring production and changes to existing orders can be rapidly passed on to the plant.