

## Manual Logic Controller (MLC)

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### ABSTRACT

The "Manual Logic Controller" also called MLC, is an electronic circuit invented and designed by the author in 2008, in order to replace the well known PLC (Programmable Logic Controller) in many applications for its advantages and its low cost of fabrication. The function of the MLC is somewhat similar to the well known PLC, but instead of doing it by inserting a written program into the PLC using a computer or specific software inside the PLC, it will be manually programmed in a manner to have the same functionality of the PLC. The program is done manually by connecting wires between coils and contacts of relays, in a way to form a program without using any memory or microcontrollers. It gives the same functionality of the PLC for small and medium programs, and moreover the contacts can support high currents, not like the PLC which supports only small current rate on its contacts. The lifetime of the MLC is much longer than the PLC, and its maintenance is much simpler, because anyone can make it or repair it. The MLC will not be defected by the variation of the input voltage and the input frequency because it is fabricated using mechanical relays which perform even if the electricity is not stable. The Grafcet and the Ladder parts of the MLC, are much simpler than the PLC for some applications, therefore, MLC is highly recommended for small and medium applications for its advantages over the PLC which are presented in this paper.

### KEYWORDS

Manual program, PLC, Logic, Relays, Programming, Grafcet.

### 1 INTRODUCTION

In Electrical Engineering, a Programmable Logic Controller, PLC or Programmable Controller is a

digital computer used for automation of electromechanical processes. It is used to control electrical devices and electromechanical devices such as machines, Air Conditioning systems, Lifts, electronic circuits, motors, Cars, etc. and any electrical or electronic devices [1-16].

The PLC has many inputs and many outputs, the number of inputs and outputs depend on the chosen size. The PLC is programmed using specific software. Every manufacturer has specific software for its PLC, the software varies from one manufacturer to another, but the concept is the same. The programming part of the PLC is done using computer and an interface that download the program from the computer to the PLC. The PLC has many advantages, but it also has many disadvantages which are presented in this paper.

In this paper, the author invented and designed a new circuit called MLC (Manual Logic Controller); the MLC can be programmed manually by connecting wires to coils and contacts of internal relays in a way to form logic operations (such as AND, OR, XOR, XNOR ... and many others), which are equivalent to a written program on a PLC. The formed logic operations in MLC lead to a perfect functioning of the inputs and outputs similar to the PLC, but the difference is that the PLC can't support high currents (for example 2A, 5A, etc...), whereas the MLC can support high currents, because it is made by using mechanical contacts with high rate of current capacity. There are many other advantages for the MLC which are presented in this paper. For instance, we can say that the MLC can replace the PLC for small and medium applications in which a simple program is sufficient to do the task. The price of the MLC is much cheaper compared to a similar PLC. The lifetime of a MLC is much

# Mlc 2015 Manual

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