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# PLC based Multimotor Controller

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**ABSTRACT:** The project is based on industrial automation and PLC is the heart of automation. The hardware and the software are the two important areas in our project. Fast and Easy PLC Control The object of a PLC simulator is to 'fake out' the input into a PLC so that the programmer can test and debug the program before installation into its operating environment. Our patent pending PLC simulators achieve this by mounting on the existing terminal strip of the PLC card and providing easy controls to turn digital inputs on/off or adjust analog signals. If you are an engineer who programs PLCs or even a Technician in need of a quick way to test a PLC functionality then these devices are for you.

## I. INTRODUCTION

### I. INFORMATION ABOUT PROJECT

1. **Hardware Description:** In this project, ALLEN BRADLEY MICROLOGIX 1100 is used for controlling the inputs and outputs. Input supply to the PLC is given through a SMPS. The rating of the SMPS is 24V DC 5Amps. The PLC used here is a compact PLC which has a fixed number of inputs and outputs. In this kind of PLC model, the CPU contains 14 digital inputs and 10 digital outputs. Toggle switches are used to serve the purpose of some inputs to the PLC.
2. **Software Description:** There are five important languages which are used for the programming of the PLC. The list of the methods are as follows: Functional block diagram (FBD) Structure text Instruction list Flow chart Ladder diagram Out of these five languages, ladder diagram is the most widely used language and is simple as compared to other languages. Ladder diagram has been used for the programming of this PLC.

### II. INFORMATION OF EACH PART

- **SWITCHED-MODE POWER SUPPLY:** A switched-mode power supply is an electronic power supply that incorporates a switching regulator to convert electrical power efficiently. Like other power supplies, an SMPS transfers power from a DC or AC source (often mains power) to DC loads, such as a personal computer, while converting voltage and current characteristics. Unlike a linear power supply, the pass transistor of a switching-mode supply continually switches between low-dissipation, full-on and full-off states, and spends very little time in the high dissipation transitions, which minimizes wasted energy. Ideally, a switched-mode power supply dissipates no power. Voltage regulation is achieved by varying the ratio of on-to-off time. In contrast, a linear power supply regulates the output voltage by continually dissipating power in the pass transistor. This higher power conversion

efficiency is an important advantage of a switched-mode power supply. Switched-mode power supplies may also be substantially smaller and lighter than a linear supply due to the smaller transformer size and weight. In this project, 24 V DC and 12 V DC SMPS had been used for the power supply of the different components used. For example, 12 V DC is used to supply power to water pump, DC geared motor and 24 V DC is used to supply power to the solenoid valve, water float switch and photoelectric sensor.

- **Thermal Overload Relay:** The coefficient of expansion is one of the basic properties of any material. Two different metals always have different degree of linear expansion. A bimetallic strip always bends when it is heated up, due to this inequality of linear expansion of two different metals.
- **CONTACTOR:** A contactor is one of the main electrical circuit parts, which can stand on its own power control device or a part of a starter. They are used to connect and break power supply lines running through power lines or repeatedly establish and - are used in light loads, complex machine control. They are used with motors, transformers, heaters. It can be considered as an intersection point between the control circuit and power circuit because it is controlled by the control circuit, it also controls the circuit between power and loads. This article focuses on the importance of contactor in an electric field. Contactors are electrically controlled switching devices which are used for switching electrically. The basic operation of this is similar to a relay, but the only difference is that contactors can carry large current compared to relay up to 12500A.
- **THREE PHASE INDUCTION MOTOR:-** A three-phase induction motor is a type of machine which is mostly used in industries. There are 2 foremost kinds of three-phase induction motor: the first one is squirrel cage and the other is wound rotor motor. The squirrel cage motor is generally used in our households and industries because it is cheapest, easy to repair and consistent. Induction motor is available in FHP (fractional horsepower) such as motor whose output power is 746 or less than it) to multiple megawatt range. FHP motors are existing in single and poly phase such as three phases. The 3-phase motors are used in such submissions where higher torque is essential. An induction motor is a kind of AC motor in which power is transferred to the rotor by the phenomena of Faraday law of electromagnetic induction. The induction motor turns (rotates) due to the force among the stator and rotor's magnetic field. The current at stator produces field which interacts with the field of rotor and torque is induced in the rotor due to which it rotates in this way electrical energy converted into mechanical energy. In today's post, we will have a look at three-phase induction motor construction, working, slip, torque and other parameters. So, let's start with the Introduction to three-phase Induction Motor.

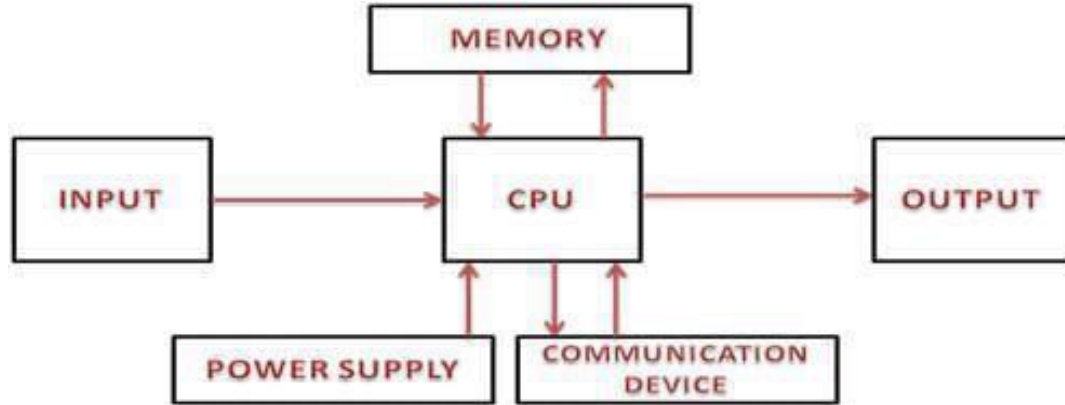
### III. ADVANTAGE

- Rugged and designed to withstand vibrations, temperature, humidity and noise.
- Have interfacing for inputs and outputs already inside the controller.
- PLCs are easily programmed and have an easily understood programming language.

### IV. APPLICATION

- Automotive Industry.
- Beverage Industry
- Entertainment Industry
- Marine Industry
- Packaging Industry

### BLOCK DIAGRAM



### V. FUTURE SCOPE

- Automotive Industry.
- Beverage Industry
- Entertainment Industry
- Marine Industry
- Packaging Industry

### REFERENCES

- V.K.MEHATA'S POWERSYSTEM BOOK PAGE NUMBER-520
- B.L.Theraja and A.K. Theraja, "Textbook of Electrical Technology", Vol. 2, 1st multi-coloured edition., S. Chand & Company Ltd., 2010. [2] Theelectrical4u.com [online] Available: <https://www.electrical4u.com/transformer-insulating-oil-and-types-of-transformer-oil/>





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