OAIJSE

OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

STEPPER MOTOR CONTROL BY USING (PLC) PROGRAMMABLE LOGIC CONTROLLERS

Sanket Zanwar[1], Ansari Nizamuddin[2], Ansari Shahid[3], Bagwan Usama[4]

Asst.Prof. Everest college of Engineering, Aurangabad, Maharashtra, India[1]
Student .Everest college of Engineering, Aurangabad, Maharashtra, India[234]

Abstract: The paper a very simple and cheaper solution for programming and controlling of stepper motor in unipolar connection by using a PLC. The stepper motor are using for robotic system. In this topic we are understand how to control stepper motor by using PLC without driver. Require to understand PLC by the study of PLC control how these component interact with each other by its main hardware component other system control by the use of PLC. In these topic we are understand how to control stepper motor by using PLC without driver.

Keywords – Stepper motor, PLC (software and hardware).

-- ∴∴∴ --

I INTRODUCTION

Before few year the use of stepper motor for precision control in manufacturing, printing, robotic looking into a dot matrix or ink jet printer one find at least two stepper motor one of them is use for rotating the platen and one for print head positioning stepper motor are use any where precise positioning is require . Basic mechanical device such as Cam, Gear, levers, for controlling the early machine . The PLC grew by using complexity stepper motor need for a more sophisticated control system. Relay and switch element wired contain in the system. To provide the control logic by the element were wire necessary for the control logic. Designed of PLC is rugged and PLC withstand vibration, shock, etc. Manufacturing equipment is exposing PLC production and development by the electrical noise and involved by the manufacturer capability of PLC expand and also expand the programming language. To allow the program of this advance capability is necessary for this. To develope their own version of ladder logic language by the manufacturers. To program PLC in general by this complicated learning since that is applicable learned all type of language one language can not be learned. One particular manufacturer of system designer is settle on this. That produce PLC to learned program comfortable and has the capability suited to his or her area of application .

II PLCs

Programmable logic controllers are a solid state, digital electronic device that control operation of machine. PLC is the control of output port base on the input port base uses on logic function, memory are used for program by using programming software of programmable controller are belong to computer device. It is used in domestic and industrial application. PLC make decision based on PLC input and control the output to machine run automatically as show in figure.
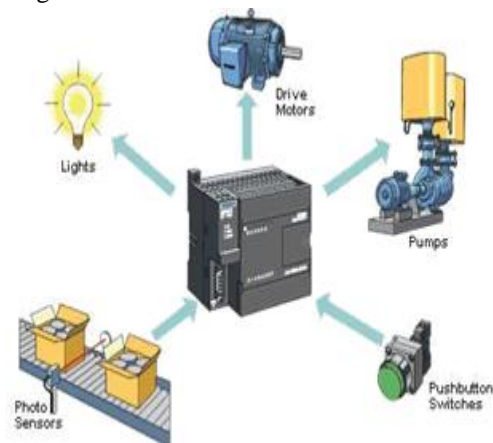

Figure 1 PLC input and output

III THE TYPICAL SYSTEM COMPONENT OF PLC

(1) CPU:

PLC controller of Central processing unit is the brain for PLC controller. The CPU system that contain the memory and making unit for the PLC decision the CPU monitor the input and make decision based on instruction held in memory the CPU perform relay, counting, timing etc.

2) MEMORY:

Information, programs and data store in memory in a PLC. The memory is the main component for the CPU. The information put in memory location is called writing. Following type of memory we are use in PLC such RAM, ROM, EPROM, and FIRMWARE etc.

Stepper motor working principle:

Stepper motor is a DC motor that can be driving by exaction to the winding .without connecting positive and negative lead of the power supply the motor can not be driven. Stepper motor rotate in step vice or sequence which is generated by controller printer is the great source of stepper motor. It does not work on AC.

Figure 2 Stepper Motor

Type of stepper motor:

1) Permanent magnet stepper motor
2) Hybrid synchronous stepper motor
3) Variable reluctance stepper motor

Advantages:

1) Motor are low cost.
2) It have high reliability.
3) High torque and low speed.
4) Simple and rugged construction.

Application:

1) It can be use in robotic application.
2) Stepper motor are use in, medical scanner, Sampler, etc
3) Stepper motor use in cameras for automatic digital camera focuses and zoom function.
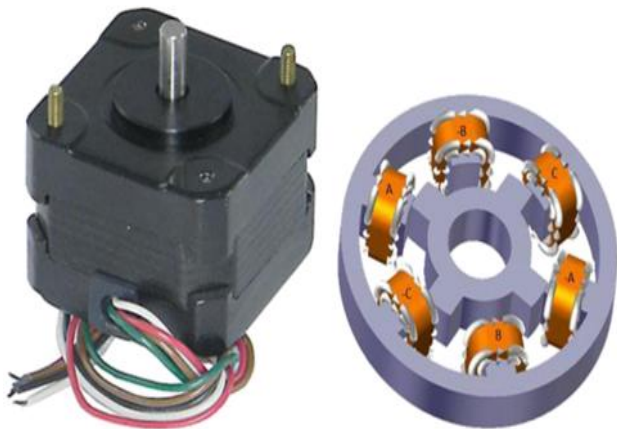
4) Stepper motor are use in floppy disk drive, computer printer, image scanner, etc

IV CONCLUSION

In recent we have many stepper motor applications. They are use in printer, disk drive, X-Y plotter, clock and watch, application. We try controlling the stepper motor (speed and positioning) by using PLC without driver.

REFERENCE

[1] Jacob, J.M. (1998) industrial control electronic: application and design _Prentice Hall

[2] Bollinger, J.G. and Duffie, N.A. (1998)"computer control of machine and process. Addison" _ Wesley publishing company.

[3] Huge Jack "Automating Manufacturing system with PLCs" volume 5.1, march 21, 2008.