Report on PLC-Fundamentals

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Venue :EEE Simulation LAB   Organized By **APSSDC**

Programmable logic controller (PLC)

A Programmable Logic Controller (PLC), also referred to as programmable controller, is the name given to a type of computer commonly used in commercial and industrial control applications. PLCs differ from office computers in the types of tasks that they perform and the hardware and software they require to perform these tasks.

While the specific applications vary widely, all PLCs monitor inputs and other variable values, make decisions based on a stored program, and control outputs to automate a process or machine. This course is meant to supply you with basic information on the functions and configurations of PLCs with emphasis on the S7-200 PLC family.

Basic PLC operation

The basic elements of a PLC include input modules or points, a Central Processing Unit (CPU), output modules or points, and a programming device. The type of input modules or points used by a PLC depend upon the types of input devices used. Some input modules or points respond to digital inputs, also called discrete inputs, which are either on or off. Other modules or inputs respond to analog signals.

These analog signals represent machine or process conditions as a range of voltage or current values. The primary function of a PLC's input circuitry is to convert the signals provided by these various switches and sensors into logic signals that can be used by the CPU. The CPU evaluates the status of inputs, outputs, and other variables as it executes a stored program. The CPU then sends signals to update the status of outputs. The programming device is used to enter or change the PLC's program or to monitor or change stored values.

Once entered, the program and associated variables are stored in the CPU. In addition to these basic elements, a PLC system may also incorporate an operator interface device of some sort to simplify monitoring of the machine or process.

In the simple example shown below, pushbuttons (sensors) connected to PLC inputs, are used to start and stop a motor connected to a PLC output through a motor starter (actuator).

PLC Basics

The Most Unconventional Guide to PLCs on the Internet

Since the late 1960's, the Programmable Logic Controller (or PLC) has become an essential aspect of any automated manufacturing process. In recent times there have been contenders to replace the PLC but the priniciples and popularity of those early PLC's functions and concepts

have continued unabated. It is essential for many people from the technician to the engineer to understand these essential pieces of equipment.

PLC Dev has developed this instruction manual "PLC Basics" in hopes it will serve the beginner to the advanced user. Our goal is to make it comprehensive as possible, providing not only the generic principles in all PLCs, but to give practical examples from many different PLC manufacturers. To this end you are welcome to comment on each section by registering as a user and clicking the "add a comment" link at the bottom of the page.

Introduction to Programmable Controllers
It's always good to get an overview of where designs have been and they are going. To do this it's essential to get a bird's eye view of the concepts and processes that make the PLC so valuable in industrial control.

What is a PLC?
A Programmable Logic Controller, or PLC for short, is simply a special computer device used for industrial control systems. The basic units have a CPU (a computer processor) that is dedicated to run one program that monitors a series of different inputs and logically manipulates the outputs for the desired control. They are meant to be very flexible in how they can be programmed while also providing the advantages of high reliability (no program crashes or mechanical failures), compact and economical over traditional control systems.

The Original Challenge
The early history of the PLC is fascinating. Imagine if you will a fifty foot long cabinet filled with relays whose function in life is to control a machine. Wires run in and out of the system as the relays click and clack to the logic.

The Race is On
This was a tall order in 1968 but four companies took on the challenge.
1. Information Instruments, Inc. (fully owned by Allen-Bradley a year later).
2. Digital Equipment Corp. (DEC)
3. Century Detroit
4. Bedford Associates

Bedford Associates, run by Richard Morley, won the contract and quickly formed a new company around the technology called MODICON after Modular Digital Control. By June of 1969 they were selling the first viable Programmable Controller the "084" (their 84th project) which sold over one thousand units. These early experiences gave birth to their next model the "184" in 1973 which set MODICON as the early leader in programmable controllers.

By 1971 Odo Struger and Ernst Dummermuth had begun to develop a new concept known as the Bulletin 1774 PLC which would make them successful for years to come.