

PLC-1-a: Basics of Electric Components for Automatic Control & PLC Applications:

About This Course:

This course provides very valuable technical & essential information about basics of electric components and the most fundamental PLC Input & Output devices, such as:

-Switches, -Relays, -Timers, -Counters, -Power Supplies, -Sensors, -Temperature Controllers, -Photo Sensors, -inverters, -Touch screen & others,

This is done for the benefit of newcomers to the PLC industry. Real-life examples are also incorporated in this course. This course is a pre-requisite or must be completed before attempting to study about Basics of PLCs. An understanding of many of the concepts covered in this course is required for understanding the practical applications of PLC control systems.

PLC-1-b: Basics and Components of PLC & Micro-controller Systems:

What is a PLC control system?

Automatic Control Using PLC (Programmable Logic Controller)

A PLC is an industrial computer control system that continuously monitors the state of input devices and makes decisions based upon a custom program, to control the state of devices connected as outputs. Almost any production line, machine function or process can be automated using a PLC. The speed and accuracy of the operation can be greatly enhanced using this type of control system.

The PLC consists of the following main parts:

Memory Unit: To store the program of the process and any other setting of the PLC

CPU Unit: It executes the program stored in the memory

Power Supply Unit: It supplies the necessary power to feed each part of the PLC with its needs (voltage and current), also the power supply unit regulates the electric AC input voltage (110/220 ACV) and removes any spikes in the signal to protect the PLC from damage by higher voltage. Also the power supply unit can supply DC voltage (12/24 DCV) which can be used for supplying other extension units or modules.

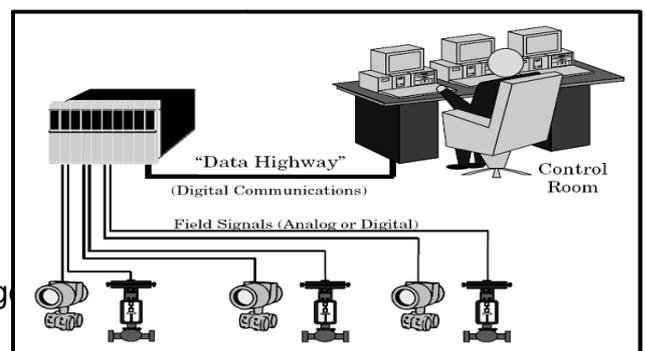
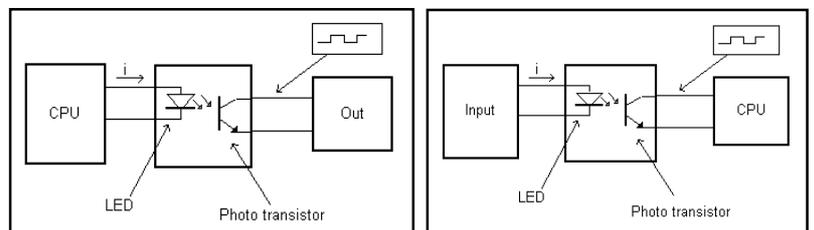
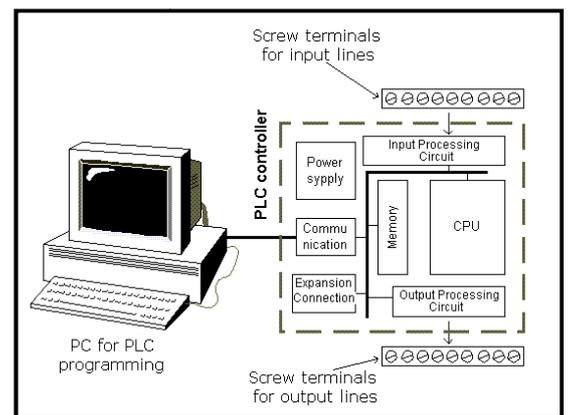
Communication Unit: It is responsible of the communication between the PLC and the PC. Communication is needed to program the PLC (stores the program written on the PC in the PLC memory), also communication can be used to send or receive any data required by the user during operations (as set-point, monitoring input/output states by the PC).

Input Processing Unit: Its function is to make electric buffering between input electric signals and inner PLC circuits to protect PLC from high voltages & currents or short circuit faults.

Output Processing Unit: Its main function is to make electric buffering between the inner PLC circuits and the output electric signals to protect the PLC from any high voltages and currents or short circuit faults.

The PC Unit: The PC has many functions:

- Programming of PLC
- Monitoring PLC I/O states
- Sending/Receiving control signals to all the controllers in case of a network
- Storing information in database



- Taking advanced actions in case of alarm or a controller failure
- Distributing loads in case of system overload

The Expansion Connection: For a PLC, it has a main module which performs most of the processing power but it has a limited number of inputs and outputs, also it has certain limited features depending on the type and model of the PLC. So, for each type of PLC there are expansion modules that perform extra operations, and the user can add modules as required for process operations.

Example: There are expansion modules for extra I/O pins, Modem or Ethernet modules for networks, Sensors or Motor driver modules, Analog I/O modules.