Chapter One

What is a Programmable Logic Controller (PLC)?

Objectives

- Describe several advantages of a programmable logic controller (PLC) over hard-wired relay systems

- Identify the four major components of a typical programmable logic controller and describe the function of each

Objectives (cont'd.)

- Define the term *discrete*

- Define the term *analog*

- Identify different types of programming devices

Programmable Logic Controller

- Solid-state system for control and operation of manufacturing equipment
  - Replaces relays, switches, counters
- Lack of hard wiring allows frequent changes to programming
- Uses RELAY LADDER LOGIC
  - High level, graphic programming language
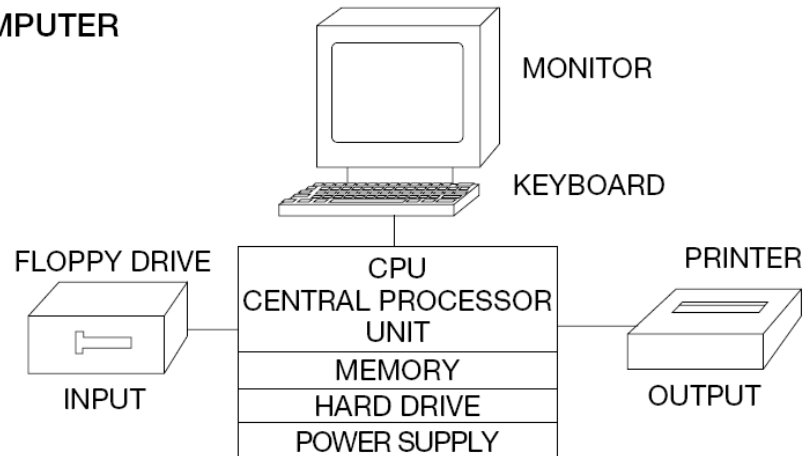
PLC Characteristics

- Designed to be operated by plant engineers and maintenance personnel

- Designed to operate in an industrial environment
  - Variations in temperature, vibration, humidity

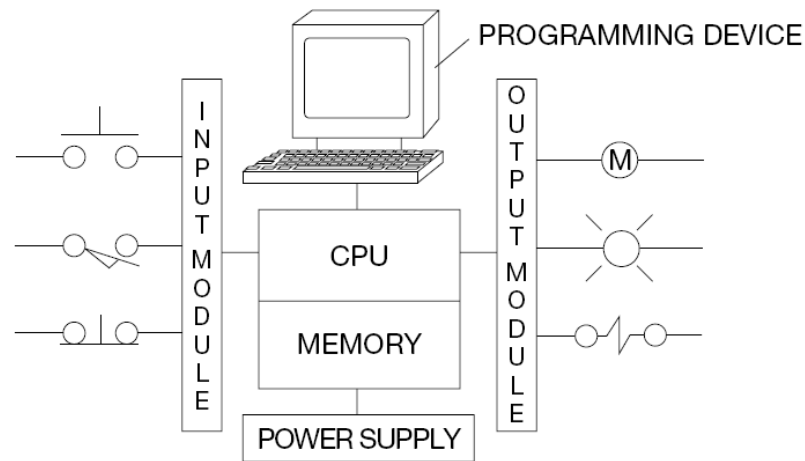- Not usually affected by electrical noise

Figure 1-1 Comparison of a Computer System and a PLC

PLC Components

- Processor unit

  – Microprocessor "brain"

- Power supply

  – Converts 120 or 240 AC volts to low voltage DC
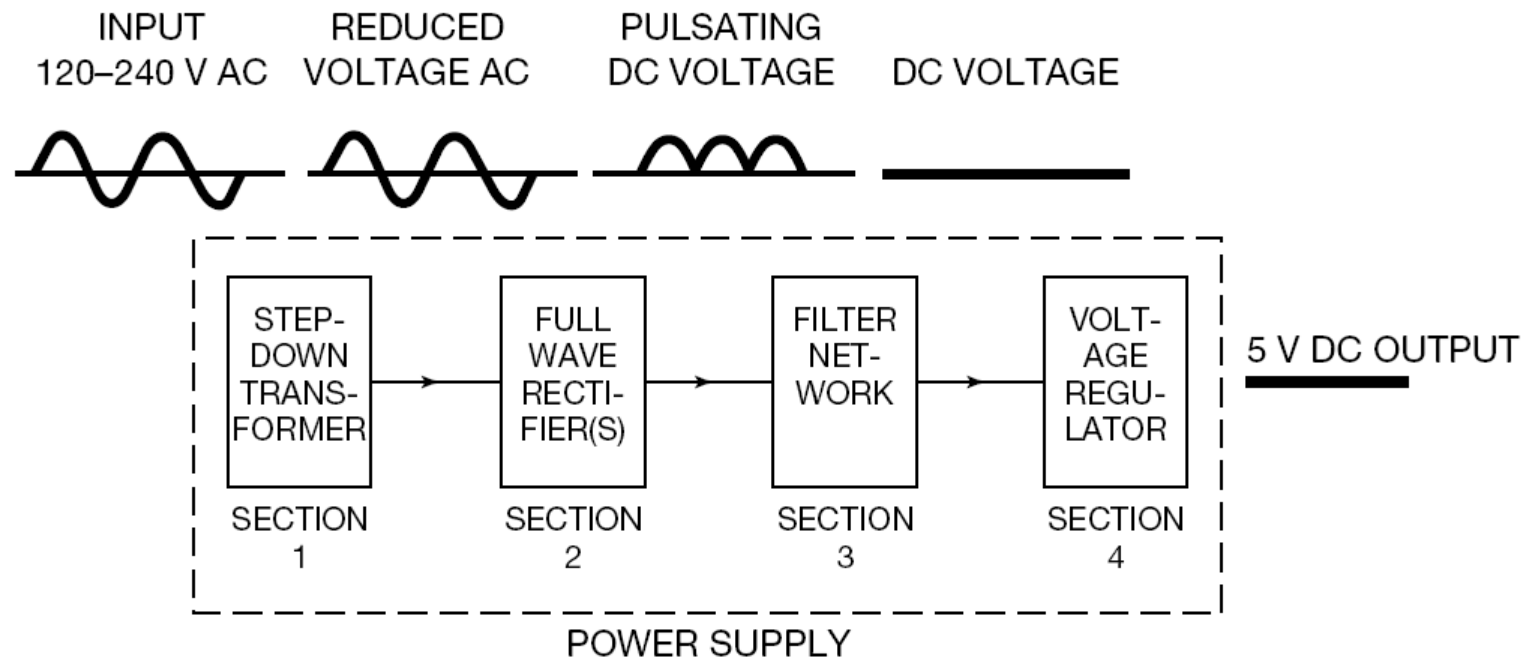
  – Can be a separate unit

Figure 1-5 Block diagram of a typical power supply

PLC Components (cont'd.)

- Input/Output interface
  - Input device examples
    - Buttons, switches, sensors
  - Output device examples
    - Motor coils, solenoid valves, lights
- Programming device
  - Used to enter desired program into memory
  - Computer is most common device

Types of I/O Devices

- Discrete
  - Either ON or OFF, open or closed
  - Examples: limit switches and push buttons
- Analog
  - Have a range of possible values
  - Examples: temperature and pressure sensors

Summary

- PLCs are used to control process machinery

- Programmable for fast, easy changes in RELAY LADDER LOGIC

- PLCs are designed to be used by technicians
  - Easy to program