



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with ‘A+’
Grade Approved by AICTE, New Delhi & Affiliated to Anna University,
Chennai



DEPARTMENT OF AEROSPACE ENGINEERING

19ASZ301– ROBOTICS & AUTOMATION IN SPACE

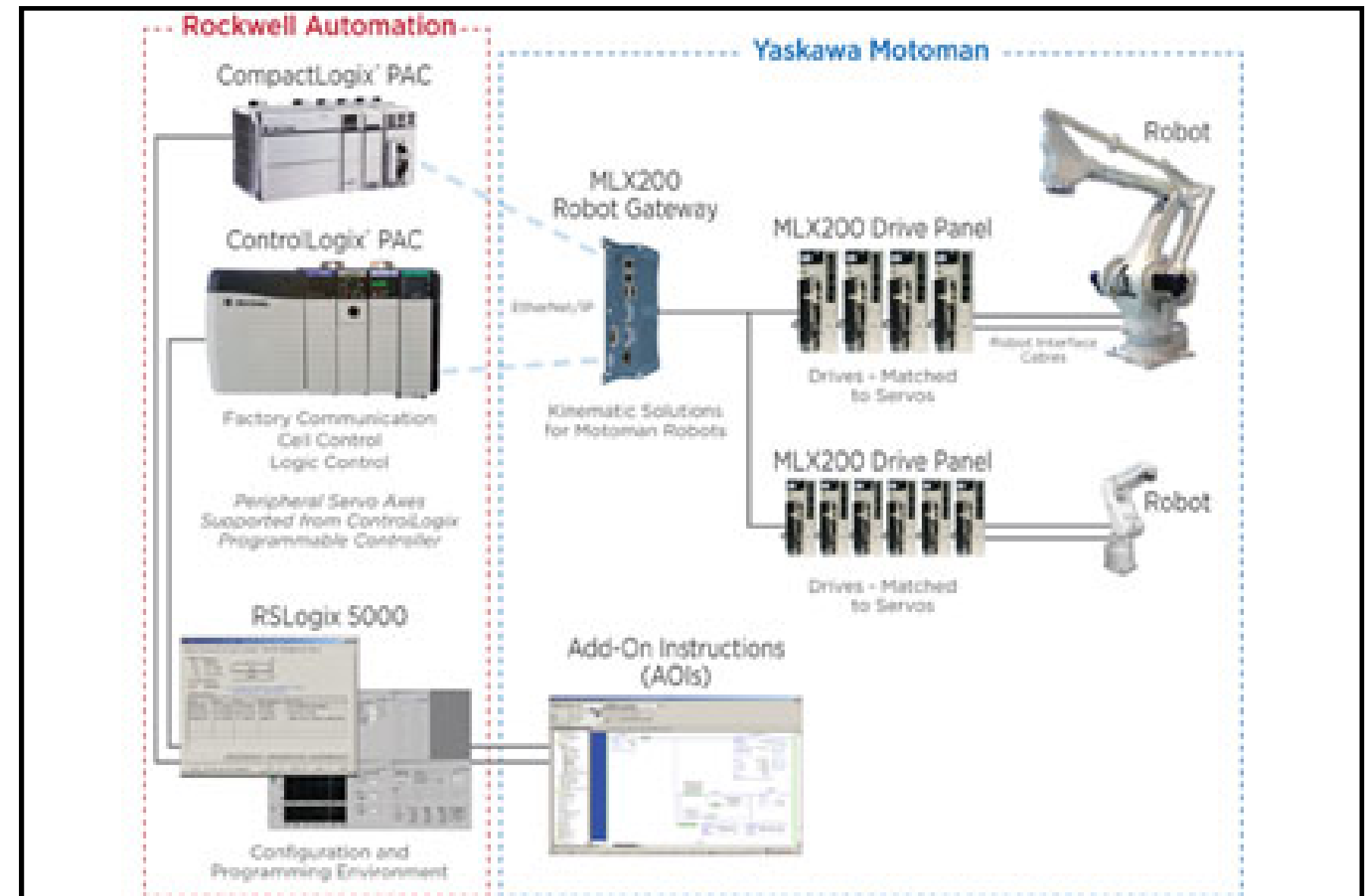
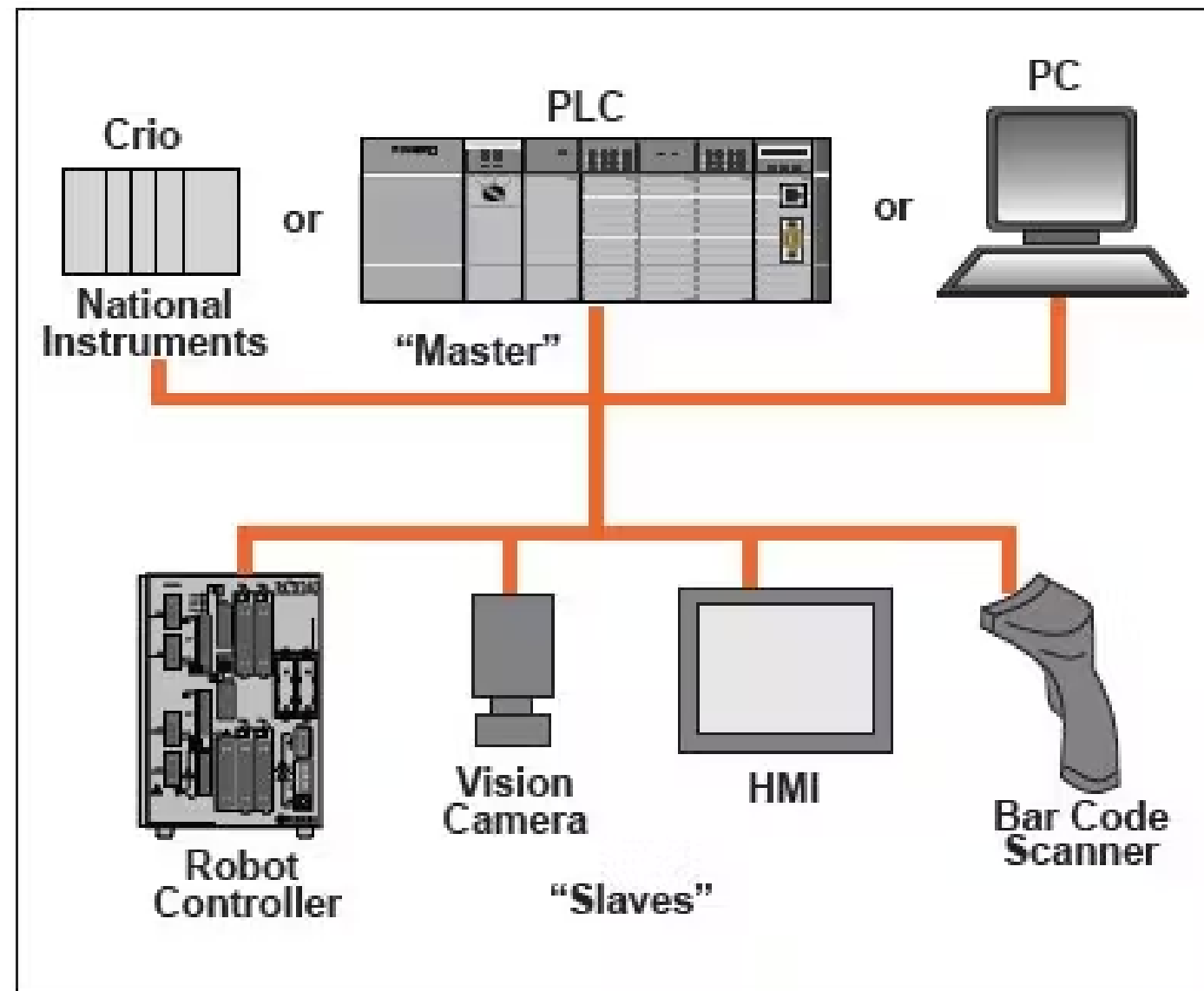
III YEAR VI SEM

UNIT 1 –INTRODUCTION TO AUTOMATION

TOPIC – PLC & AUTOMATION CYCLE



PLC IN AUTOMATION





PLC INTRODUCTION



PLC (Programmable Logic Controller)

A PLC (Programmable Logic Controller) is a rugged digital computer used for automating electromechanical processes in industries, such as control of machines on factory assembly lines, amusement rides, or lighting fixtures.

Key Features of PLCs

- Real-time control
- High reliability in harsh industrial environments
- Programmable using ladder logic or other programming languages
- Modular design for easy integration and expansion

Basic Components of a PLC

1. Power Supply – Provides the required voltage to the PLC system.
2. CPU (Central Processing Unit) – The brain of the PLC; processes logic and controls I/O.
3. Input/Output Modules (I/O)
 - Input Modules: Receive signals from sensors (e.g., push buttons, temperature sensors).
 - Output Modules: Send signals to actuators (e.g., motors, lamps, valves).
4. Programming Device – PC or HMI used to write, debug, and upload programs to the PLC.
5. Communication Interface – Connects the PLC with other devices or networks (Ethernet, Modbus, PROFIBUS).

Common PLC Programming Languages (as per IEC 61131-3)

- Ladder Logic (LD) – Graphical, looks like electrical relay diagrams (most common).
- Function Block Diagram (FBD) – Uses blocks to define functions.
- Structured Text (ST) – Similar to high-level programming languages (like Pascal).
- Instruction List (IL) – Low-level, assembly-like language.
- Sequential Function Charts (SFC) – Flowchart-style for sequence control.

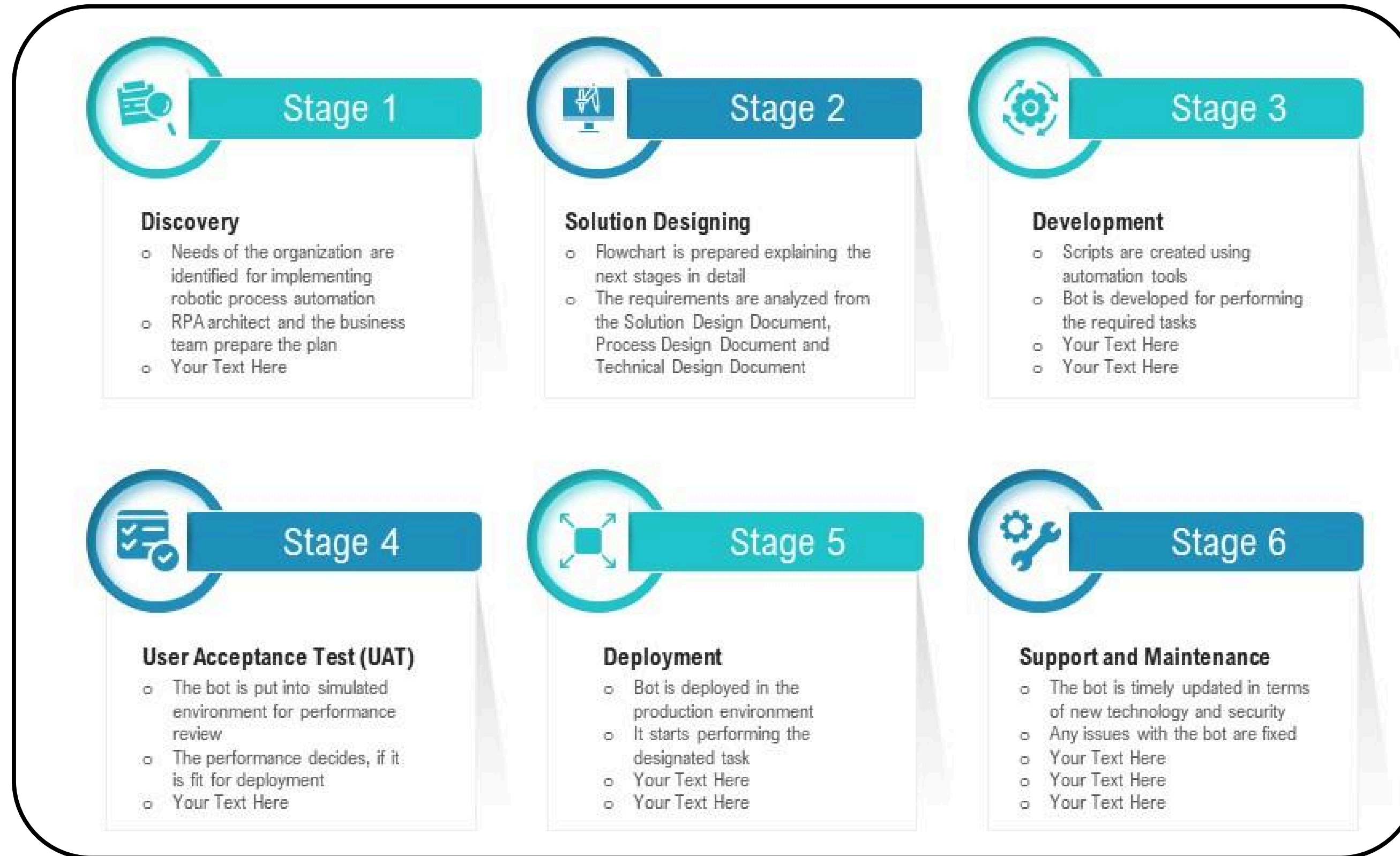


Applications of PLCs

- Automatic bottle filling systems
- Traffic light control
- Elevator automation
- Conveyor belt systems
- CNC machine control
- Building management systems



AUTOMATION CYCLE





Thank You