SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

19EE504 - SPECIAL ELECTRICAL MACHINES
UNIT – 3
STEPPER MOTOR
CLOSED LOOP CONTROL OF STEPPER MOTOR

Contents

- Limitations of open loop control and need for closed loop operation
- A closed loop operation system using a microprocessor

UNIT III - STEPPER MOTOR

Limitations of open loop control and need for closed loop operation

Open-loop control systems have several limitations, including:

- **Error detection and correction:** Open-loop systems can't detect or correct errors.

- **Accuracy**: Open-loop systems have poor control accuracy and interference suppression performance.

- **Sensitivity to changes:** Open-loop systems are sensitive to changes in system parameters.

- **Handling disruptions:** Open-loop systems can't handle major disruptions.

- **Reliability:** Open-loop systems are unreliable and can't adapt to uncertainties.

- **Flexibility:** Open-loop systems lack the flexibility to self-correct and recover from accidental stoppage.

Limitations of open loop control and need for closed loop operation

Closed-loop control systems are better suited for tasks that require high accuracy and the ability to handle external disturbances. Closed-loop systems have several advantages over open-loop control, including:
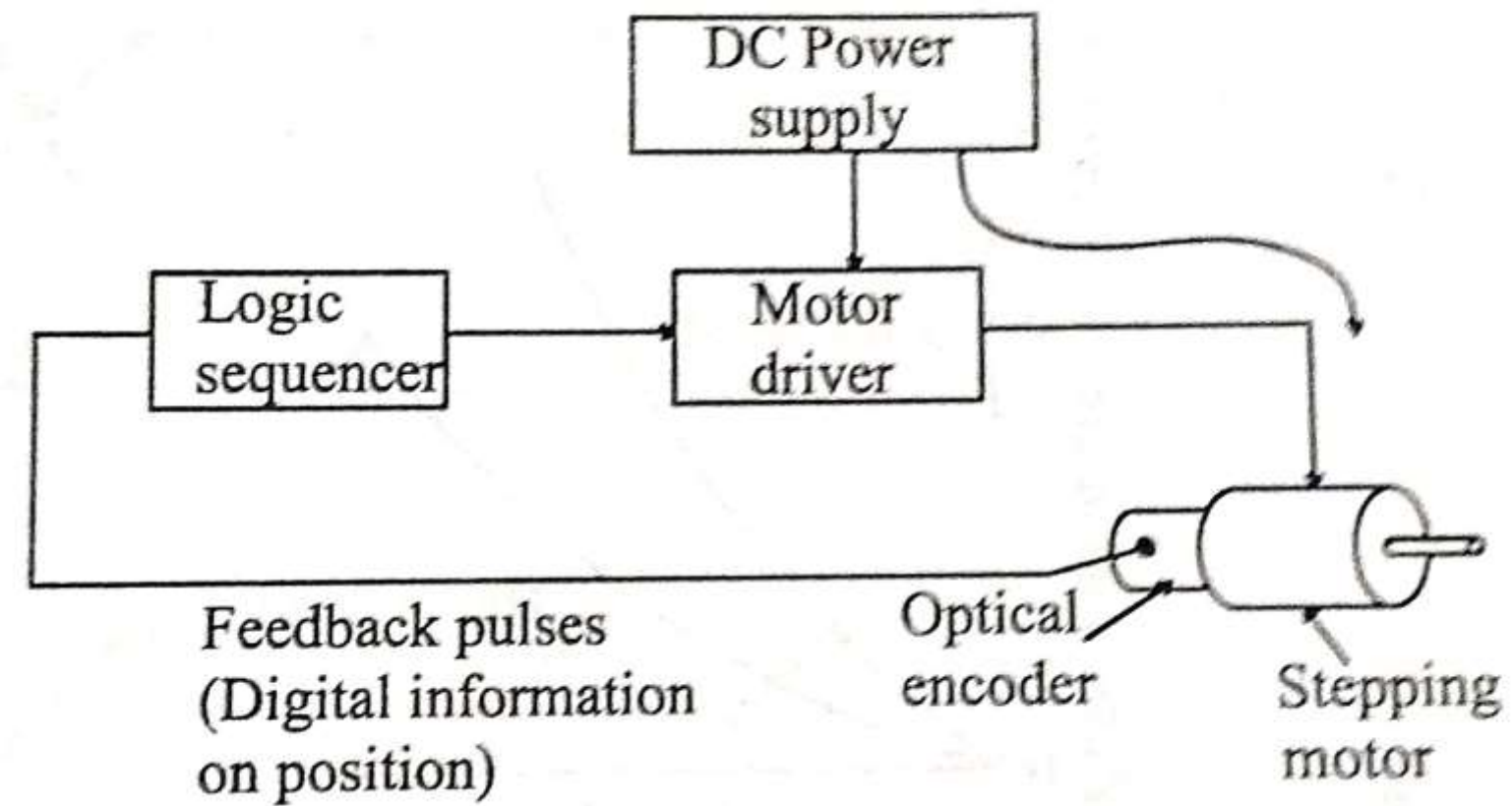
Accuracy: Closed-loop systems continuously monitor and adjust the motor's performance, resulting in higher accuracy and precision.

Adaptability: Closed-loop systems can automatically compensate for changes in operating conditions.
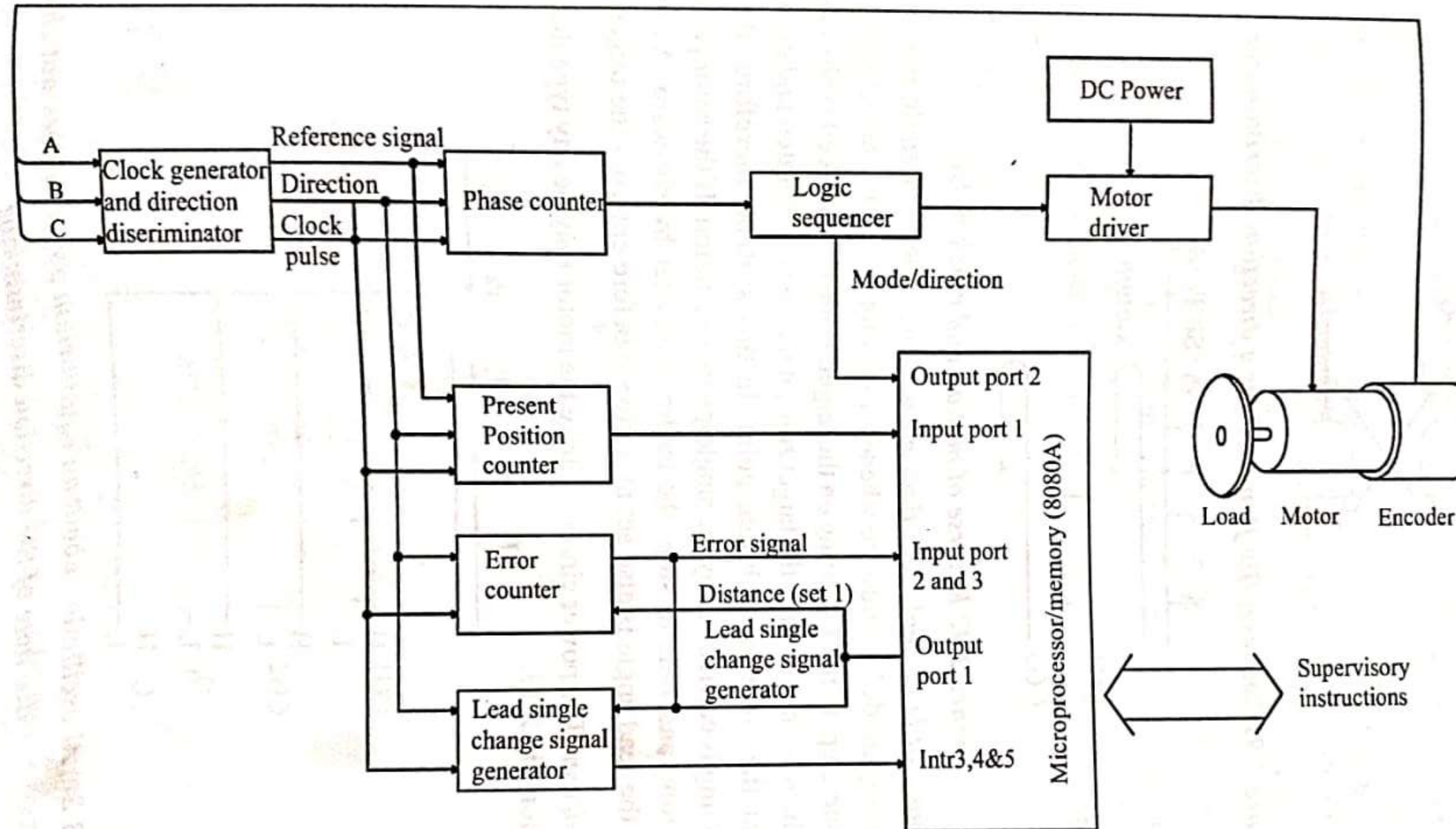
Robustness: Closed-loop control is more resilient to external factors.

Simple closed loop operation of stepper motor

Closed loop control using a Microprocessor

Assessment - 1

- What criteria's are necessary while considering a stepper motor.
  - Mechanical motion
  - Inertia load
  - Speed Requirements
  - **All the above**

Assessment - 2

- Which of the following is not an advantage of stepper motor.
    - Cost efficient
    - Maintenance free
    - No feedback
    - **More complex circuitry**