FACULTY OF ENGINEERING & TECHNOLOGY

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INTRODUCTION

Example of Closed Loop Control Process

1. Thermostat Heater

The thermostat heater is an example of closed loop control system. The thermostat senses the temperature of the system and maintains the temperature.

Thermostat heater	
Input	Temperature
Plant	Heater
Controller	Thermostat
Output	Temperature

2. Sun seeker solar system

Sun seeker solar system is an automatic tracker which uses LDR to sense the sunlight. A microcontroller reads the LDR voltage and signals the connected motor which rotates the panel towards the sun.

Sunseeker solar system	
Input	Sunlight
Plant	Solar Panel
Controller	µC
Output	Position change

3. Voltage stabilizer

The voltage stabilizer stabilizes the supply voltage in case of fluctuations. Modern voltage stabilizers utilize solid state electronic components which measure the fluctuation in voltage and reduce/increase (buck/boost) the voltage to the desired level.

Voltage Stabilizer	
Input	Voltage
Plant	Stabilizer
Controller	Electronic Circuit
Output	Voltage Buck/Boost

4. Auto Engine

The tachometer in auto engine generates a voltage proportional to the speed of the shaft. The voltage is subtracted from the input voltage to calculate an error voltage that provides information about current speed and desired speed. The error voltage is then used to arrange the throttle after amplification.

Auto Engine	
Input	Desired speed
Plant	Auto Engine
Controller	Cruise system
Output	Change in speed

INTRODUCTION

Comparison Open Loop Control Process & Closed Loop Control Process

Basis For Comparison	Open Loop Control System	Closed Loop control System
Definition	The system whose control action is free from the output is known as the open loop control system.	In closed loop, the output depends on the control action of the system.
Other Name	Non-feedback System	Feedback System
Components	Controller and Controlled Process.	Amplifier, Controller, Controlled Process, Feedback.
Construction	Simple	Complex
Reliability	Non-reliable	Reliable
Accuracy	Depends on calibration	Accurate because of feedback.
Stability	Stable	Less Stable
Optimization	Not-Possible	Possible
Response	Fast	Slow
Calibration	Difficult	Easy
System Disturbance	Affected	Not-affected
Linearity	Non-linear	Linear
Examples	Traffic light, automatic washing machine, immersion rod, TV remote etc.	Air conditioner, temperature control system, speed and pressure control system, refrigerator, toaster.