CONCEPTS OF CONTROL SYSTEMS-OPEN LOOP & CLOSED LOOP CONTROL SYSTEMS AND THEIR DIFFERENCES-DIFFERENT EXAMPLES OF CONTROL SYSTEMS

CONTROL SYSTEM & INSTRUMENTATION (EC601)
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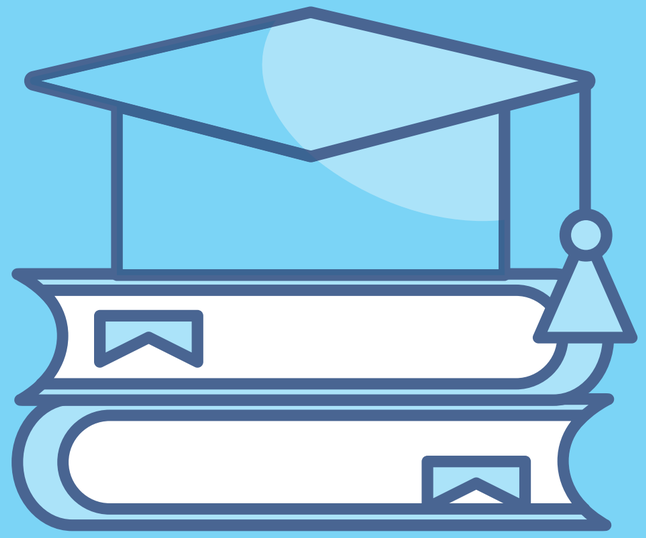

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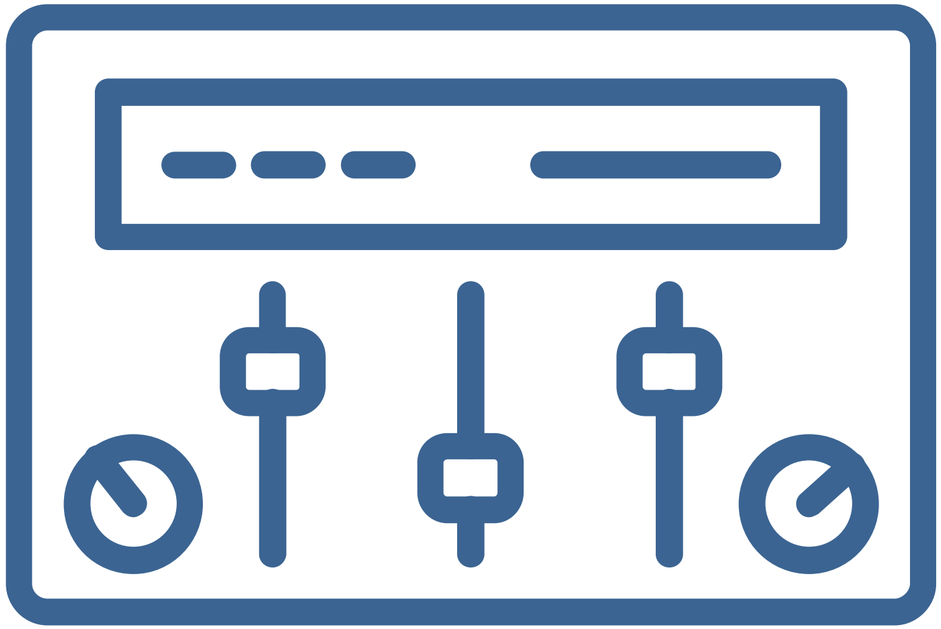
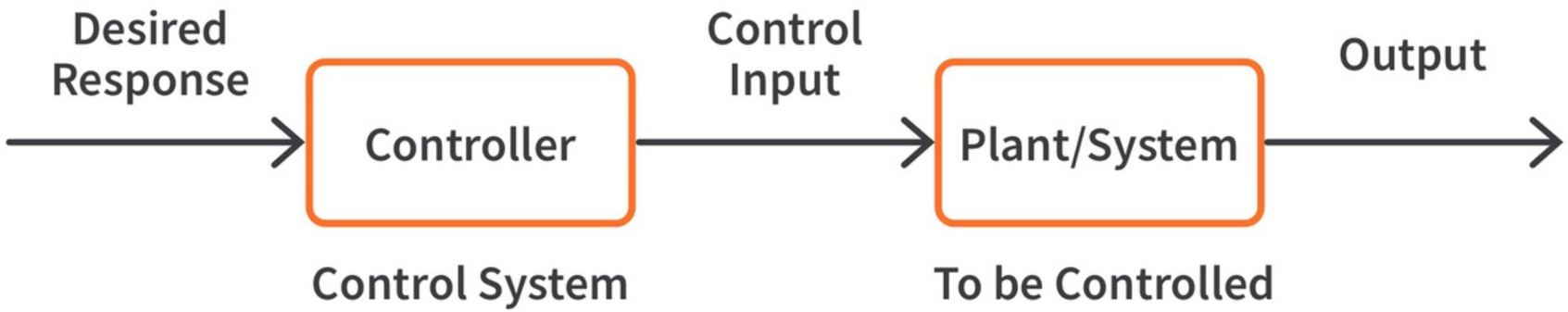


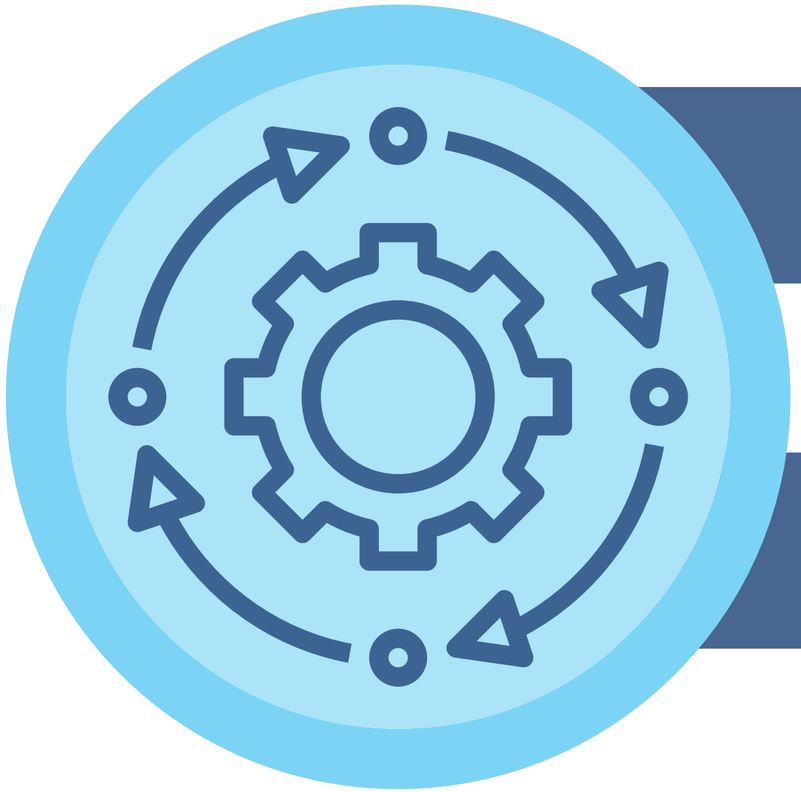
Concepts of Control Systems

- A **system** is a collection of things that are put together with the intention to perform a specific task.
- A **control system** is a mechanism that directs the input it receives through the systems and regulates their output.
- In other words, the **definition of a control system** can be simplified as a system, which controls other systems.



Types of Control Systems

There are two main types of control systems. They are as follows:



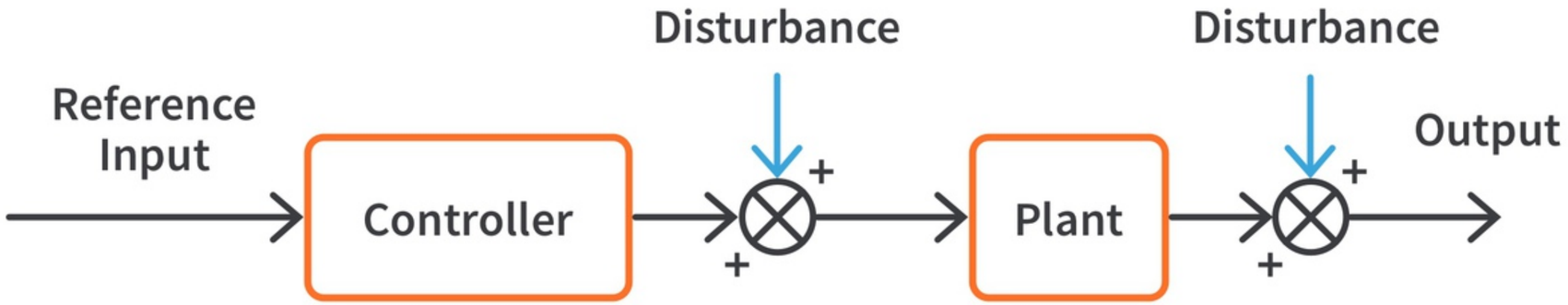
Open Loop Control System

Closed Loop Control System

Open Loop Control System

A control system in which the control action is totally independent of the output of the system then it is called an open-loop control system.

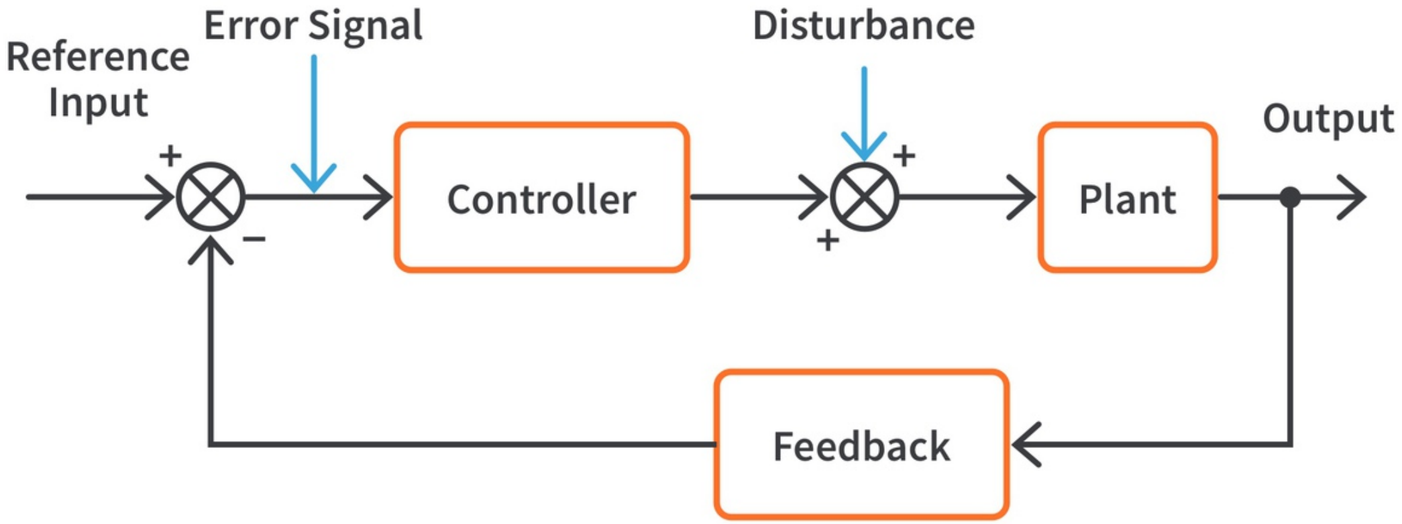
- The control action is independent of the fact that we achieved the desired output or not.
- There is no feedback involved.
- A good example would be the control of simple traffic lights where the operation of each light depends only on a fixed time.



Closed Loop Control System

Control systems in which the output has an effect on the input quantity in such a manner that the input quantity will adjust itself based on the output generated is called closed-loop control system.

- The closed-loop control systems are also known as feedback control systems.
- Here, the control action is dependent on the desired output.



Difference between Open-Loop & Closed-Loop Control Systems

Open Loop Control System

- In this system, the controlled action is free from the output.
- This control system is also called a Non-feedback control system.
- The components of this system include a controlled process and controller.
- The construction of this system is simple.
- The accuracy of this system mainly depends on the calibration.

Closed Loop Control System

- In this system, the output mainly depends on the controlled act of the system.
- This type of control system is also called a feedback control system.
- The components of this kind of system include an amplifier, controlled process, controller and feedback.
- The construction of this system is complex.
- These are accurate due to the feedback.

Examples

Open Loop Control System

- Automatic washing machine
- Traffic light
- TV remote
- Immersion rod, etc.

Closed Loop Control System

- AC
- Control systems for temperature, pressure and speed
- Refrigerator, etc.

thank you!