

System type and control action

Here is an experiment using Simulink for System type and control action:

Experiment Objective:

The objective of this experiment is to demonstrate the use of Simulink to investigate the relationship between system type and control action. The experiment will use a simple feedback control system to explore how the system type affects the system's response to a step input.

Experiment Procedure:

1. Create a Simulink model of a simple feedback control system.
2. Set the system type to 0, 1, and 2.
3. Apply a step input to the system.
4. Observe the system's response to the step input.
5. Repeat steps 2-4 for different values of the system parameters.
6. Analyze the results to gain an understanding of how the system type affects the system's response to a step input.

Experiment Results:

The results of the experiment will vary depending on the system that is being analyzed. However, in general, the experiment should demonstrate the following:

- The system type affects the system's rise time, overshoot, and settling time.
- A higher system type results in a faster rise time, less overshoot, and a quicker settling time.
- The system type also affects the system's stability. A system with a type of 0 is unstable, a system with a type of 1 is marginally stable, and a system with a type of 2 or higher is stable.

Experiment Safety:

There are no safety concerns associated with this experiment. However, it is important to follow the instructions carefully and to use caution when working with electrical equipment.

Experiment Creativity:

There are many ways to creatively approach this experiment. For example, you could analyze the response of the system to different types of input signals. You could also use Simulink to create a 3D animation of the system's response.

Experiment Conclusion:

This experiment provides a hands-on introduction to the relationship between system type and control action. The experiment also demonstrates the use of Simulink for analyzing the response of feedback control systems.