SENSORS AND INSTRUMENTATION

Guess Today's Topic????

SECOND order performance

- In the context of measurement systems, the terms "first order" and "second order" refer to the order of the system's response to changes in input. Specifically, a first-order system responds to changes in input at a rate proportional to the input, while a second-order system responds to changes in input at a rate proportional to the input and its first derivative.

SECOND order performance

Bandwidth

Second order systems are defined by a second order differential equation. They can be underdamped leading to overshoot; they can be critically damped in which case the transient response looks like that of a first order system; or they can be overdamped resulting in sluggish behavior without overshoot.

SECOND order performance

- The performance of a measurement system depends on its order, as well as other factors such as its accuracy, precision, and sensitivity. In general, second-order systems are more complex and can provide higher accuracy and faster response times than first-order systems.

- However, second-order systems can also be more sensitive to noise and other disturbances, which can lead to measurement errors. Additionally, second-order systems may require more complex and expensive instrumentation and data analysis techniques to accurately measure their response.

SECOND order performance

- Therefore, the choice of a first-order or second-order measurement system depends on the specific application and requirements of the measurement, as well as the available resources and expertise