

Recommended Assessment

Filtering

1. Why is the encoder-based measurement noisy? Is it a continuous signal?
2. Attach the encoder-based speed and motor voltage screenshots before and after the filter was applied. Did the response improve after filtering?
3. What is the cutoff frequency of a low-pass filter $50/(s + 50)$? Provide an answer in both *rad/s* and *Hz*. What are the benefits and trade-offs of lowering or raising the cutoff frequency?
4. Provide a screenshot of your speed scope output response comparing the filtered encoder-based speed response and the speed response using the tachometer. What were the differences between using the tachometer vs differentiating the position and then adding a filter? Did the output improve?