

Platform Sinusoidal Motion Test

Description:

This test is performed to determine if the platform is moving at the expected displacement of the sine wave. Multiple trials will be conducted at different weights. The motor velocity will be constant throughout trials.

Materials:

1. Fully assembled prototype
2. Bright marker
3. Camera
4. Kinovea software

Procedure:

1. Assemble complete prototype.
2. Connect the motor to the microcontroller and plug into power.
3. Connect the microcontroller to a laptop with the required files.
4. Ensure that the latest version of the active program is uploaded to the motor.
 - a. The latest main.cpp can be downloaded from Lab Archives.
5. Place a bright marker on the platform to mark the initial position.
6. Set-up camera in full view of the platform and begin recording a video from the top view.
7. Run the function “sinusoidalSpeedVariation()” by pressing 2.
 - a. This program will set the velocity of the motor to a sine wave with amplitude of 10 RPM, frequency of 8/60 Hz, and offset of 0. It will for 60 seconds
8. Once complete, stop recording the video.
9. Upload the video to Kinovea. Calibrate by drawing a line of known length on the video.
10. Place a tracking marker on the bright dot in the video. Track the displacement throughout the entire time the platform is moving.
11. Export the data to excel to perform statistical analysis.
12. Repeat steps 5-11 with different weights on the platform, ranging from 0-4 kg.