



EZMotion

INSTALLATION/SOFTWARE/USAGE

Q: Question

Is there a “warmup period” for EZMotion hardware? If so, will my measurement be affected?

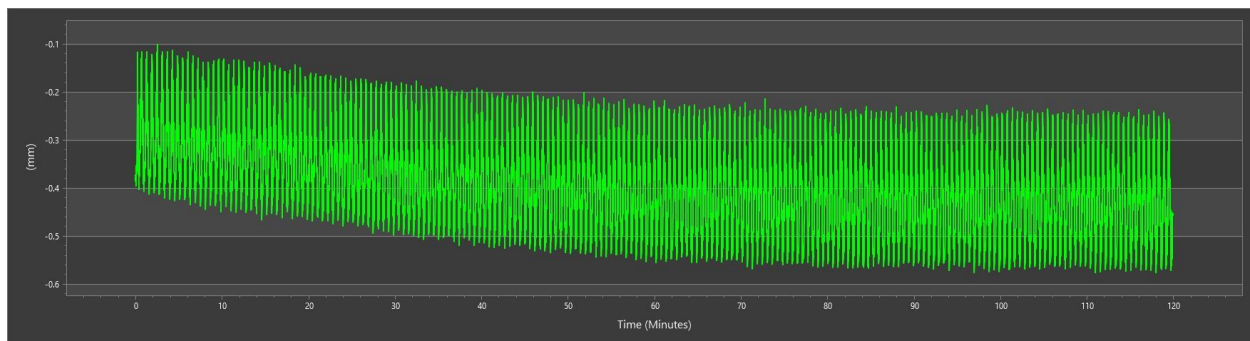
A: Answer

In short, **yes**. As EZMotion cameras begin to capture and stream data into the system, they will heat up considerably within their housings. This literal warming up can cause the Camera Unit to “loosen up” slightly, causing a very small, but non-negligible, drift in position measurement over time.

To test this warmup effect, two EZMotion trackers were placed at opposing ends of a 1-meter-long bar rotating slowly about its center. The test was performed with 20mm-dot trackers, lenses of focal length 8mm, and a 1m camera bar at a standoff distance of 2 m.

To ensure a “cold” start, the EZMotion cameras and lights were left unplugged for >12 hours prior to testing. Recording began immediately after the cameras and lights were plugged in and switched on, and was run for two hours with minimal changes in environmental lighting and temperature.

A residual position measurement of the trackers (which exhibits a sinusoidal pattern) yielded the following:



- There is a noticeable shift in position over time, most exaggerated at the start of the measurement (when the cameras are coldest).
- The shift begins to lessen in magnitude after **60 minutes** and is roughly nonexistent by **90 minutes**.
- Overall, the magnitude of the shift is **not more than 0.2 mm**.



- The **magnitude of the measurement is not affected** by the shift (the oscillation remains roughly the same width throughout the test); measurement values are only offset, not scaled.

In summary, an artificial offset of a fraction of a millimeter can be introduced by EZMotion cameras heating up after a period of disuse; however, this offset does not distort the magnitude of a measurement, and should be imperceptible in sufficiently large measurements.

Additionally, even from a “cold start,” this offset will be imperceptible in recordings shorter than several minutes.

If it is critically desired to avoid this “warmup” offset for long recordings, we advise leaving the cameras powered on for at least **60 to 90 minutes** prior to performing measurements.