

VOICE COIL ACTUATOR DEVELOPER'S KIT APPLICATION – LIFE TESTING

Background

Voice Coil Actuators (VCAs) provide a compact means to produce linear actuation. They can operate open-loop or with an internal sensor, as a closed loop actuator. Fully closed loop control can allow the system designer command precise speed, position and force to the VCA.

- As the range of VCA designs has expanded, the applications and controllers available to operate them have expanded as well.
- It is now possible to specify VCAs with:
 - Stroke lengths from 0.25 inches to 1.25 inches
 - Frequencies up to 120 Hz
 - Actuation force from 3.5 lbs to 340 lbs

One application for which VCAs are particularly well suited is in life testing. Interestingly enough, in order to validate the use of a flex circuit on one of our designs, we needed to build our own life-tester in-house. This resulted in a series of tests and design improvements that opened up opportunities with customer applications for life-testing their designs.

Accelerated life tests typically require the following attributes:

- Fixed frequency and stroke over the test interval
- Reliable and repeatable actuation that can outlast the device under test (solenoids, pneumatics, pick and place operations, fatigue testing)
- Cycle life measured in billions! One medical application requirement for a heart valve component required these high cycle lives. (One billion cycles at 20 Hz would take 1.6 years of testing for example)

Solution

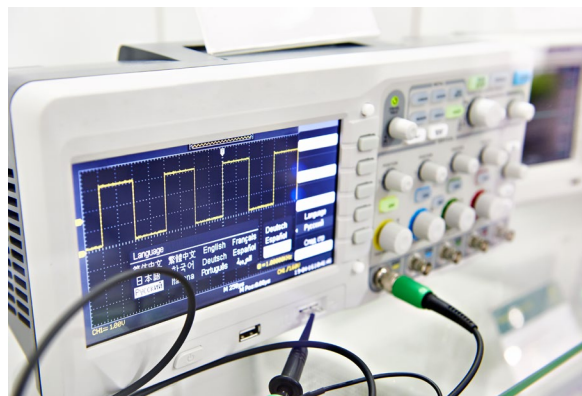
The VCA developer's kit offers a complete operational package, allowing the test designer to get up and running very quickly. The VCA is self-contained with its own shaft, bushing and internal feedback sensor. It also includes the controller and sample programs that allow for quick set-up and immediate results.

- The VCA is direct drive, low noise, has a high operational life and can operate to high frequencies
- The model LAS13 VCA has been operationally tested beyond 500 million cycles
- A PC-operated microcontroller included in the kit allows for data storage for force, position, velocity, current, voltage, as well as real time data, available for analysis and control. It can accept inputs from other sensors as well and it can store macros that allow for running a test at the touch of a button.

How a customer can leverage this technology



For one customer, we were able to program one button to move the shaft to one end of the stroke and a second button to move the to the other end of the stroke. These two commands gave the customer the ability to verify the total stroke. The next two buttons were used one for 5 hz and the other for 10 hz operation.

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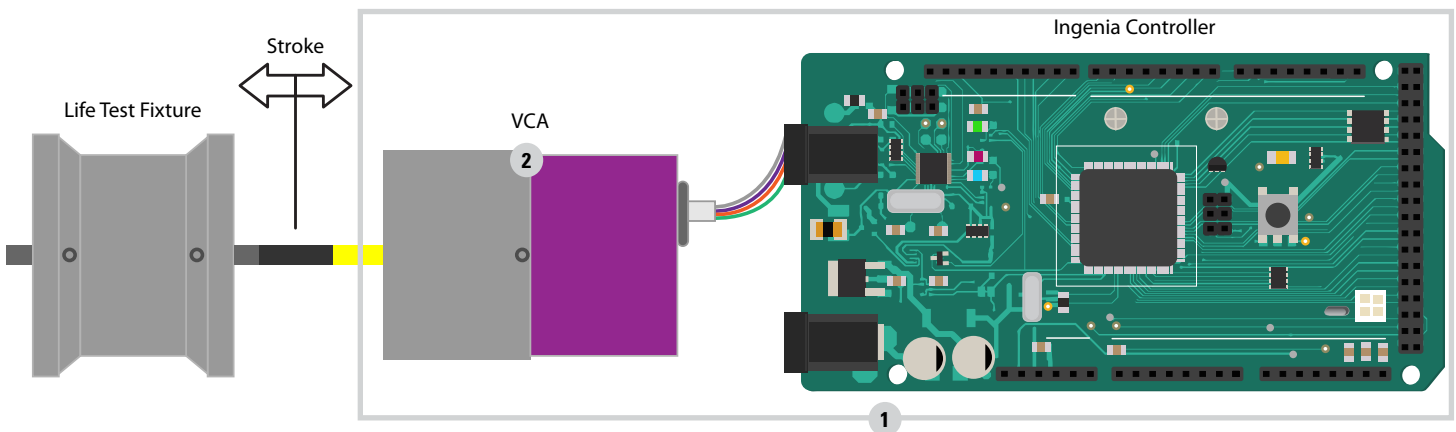


RECOMMENDED PRODUCTS

| Reference on Diagram | Product | Features | Function | Brand |
|----------------------|---|---|------------------------------|-----------|
| 1 |  Developer's Kit | Microcontroller and integrated sensor VCA | Complete Operational Package | BEI Kimco |
| 2 |  LAS28-53-000A-P01-12E | VCA with Feedback Sensors | Linear Actuation | BEI Kimco |



DIAGRAM



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