



University of Idaho

College of Engineering

BUTTON CYCLER ENHANCEMENTS FOR ADVANCED INPUT SYSTEMS

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PROBLEM STATEMENT

Develop enhancements to a button cycler for use in qualification testing of electro-mechanical switches designed into Advanced Input Systems' products.

CURRENT SYSTEM DRAWBACKS

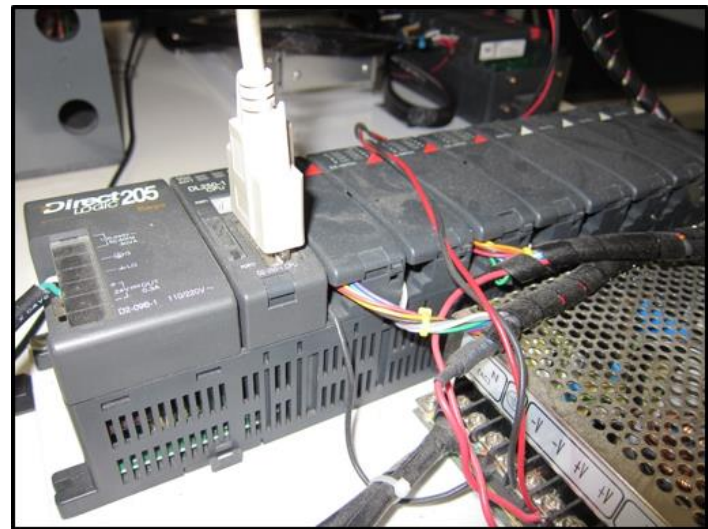
- I No way to monitor or adjust force applied by pneumatic Bimbas.
- I No way to measure or quantify **switch health**.
- I Switch closure count doesn't indicate *when* an error has occurred.

SYSTEM REQUIREMENTS

- I Test 1 to 30 switches simultaneously at a rate from 1Hz to 5Hz,
- I Allow operator to assign **force**, **cycle rate**, and **cycle count** prior to test start.
- I Monitor switch health during cycling:
 - I Open/Closed resistance waveform
 - I Switch bounce that lasts >10ms
- I Show present values of data logging during test.
- I Allow operator to pause/resume/restart tests and save test setups.
- I Format Excel report at test end.

- I [Optional] → Adjustable force based on switch health.
- I [Optional] → Integrate Force/Displacement/Resistance switch characterization

CURRENT BUTTON CYCLER



SWITCH CHARACTERIZATION

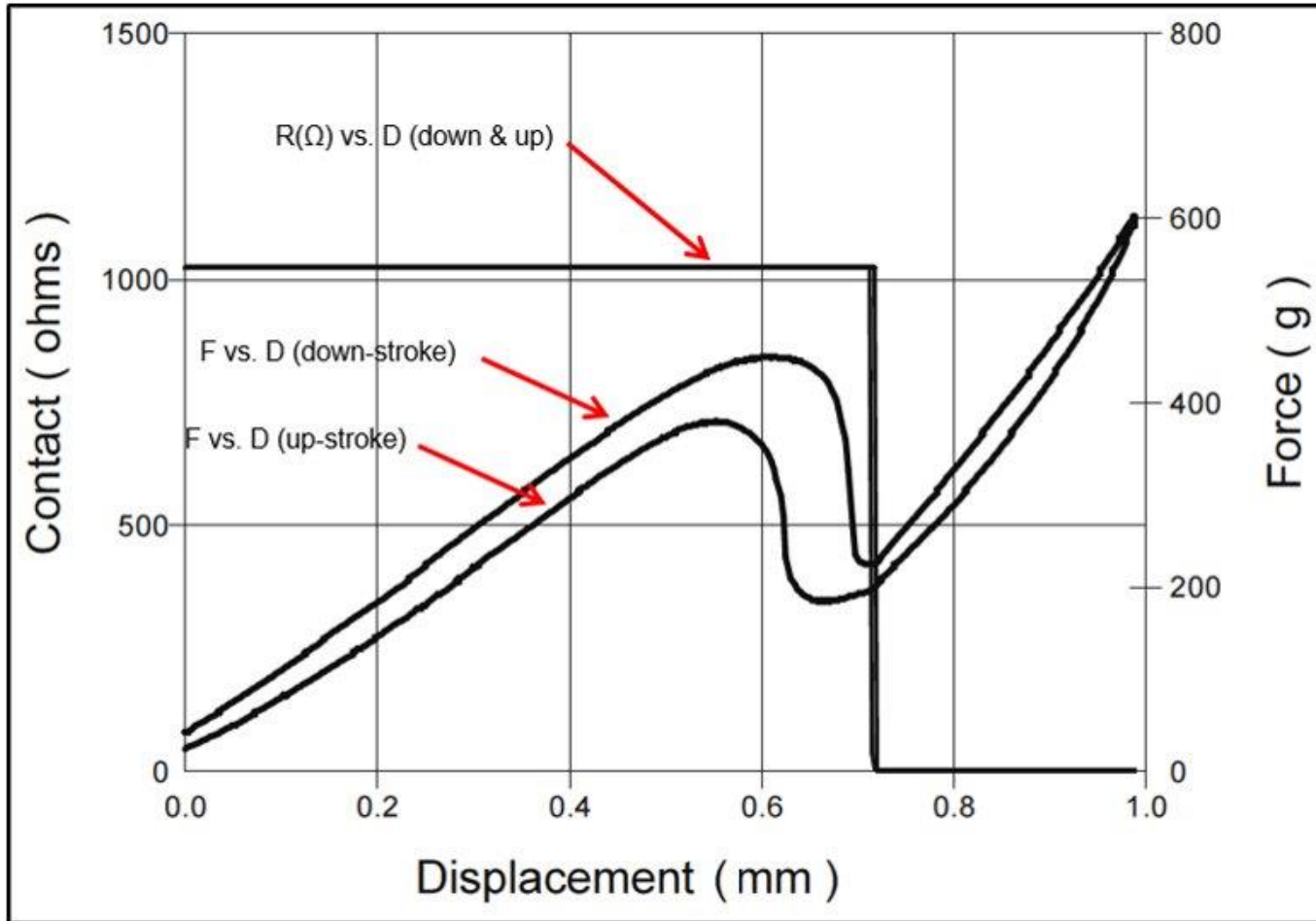


Figure 1: Example of F/D/R curve for electro-mechanical switch