

## Senior Capstone Design

Project: [AIS Button Cyclers Enhancements](#)

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Date: **12/4/2019**

### Design Validation Plan & Results (DVP&R)

Requirement	Test	Test Subject	Target Date	Result	Recommendation
Force set and calibrated prior to test start	Use load cell to measure accuracy of Bimba force at variable input settings as well as <i>degree of error over many cycles</i>	Individual Bimbas and full system			
System must function off existing pneumatic supply (100 psi)	Full battery short test	Full system, regulator tanks	10/22/19	Confirmed	
Characterize switch F/D/R at preset intervals	TBD				
Monitor switch resistance	Produce waveform of switch resistance over time	LabView VI	10/23/2019	Confirmed	
Flag switch bounces > 10 ms	Manual test	LabView VI	12/4/2019	Partially complete	
Increment count of switch closures and flag failures	Short run test	LabView VI	11/5/2019	Confirmed	
Datalog bounces and failed closures	Short run test	LabView VI			
System must accomodate 1-30 buttons per test	Check all functions with 1 Bimba, then expand to 4, 10, 20, and 30	System prototypes (during development)			
System must fit within 12Hx24Lx36W inches	Measure full system block volume	Full system prototype	10/23/19	Confirmed	
System must have a cycle rate of 1-5 Hz	Check all functions at 1, 2, 3, 4, and 5 Hz	Full system prototype	10/23/2019	Confirmed	
Rail must be stable under max load	Use strain gauges to measure rail feedback from max force/max Bimbas at each preset cycle rate	Full system prototype			
Test parameters are to be graphically assigned	Run several iterations of small sample tests to verify input parameters	Full system, electronic pressure valve, LabView VI			

LabView/Windows 10 implementation	Small sample run	Priority 1 system	10/31/2019	Confirmed	
GUI must show present values during test	Create indicator to report data	Priority 1 system	10/20/2019	Confirmed	
GUI must include Start, Stop, Pause, Resume, and Restart test options	Program state implementation	Priority 1 system	11/15/2019	Confirmed	
GUI must provide means to save and recall test setups	TBD				
GUI must provide means to save and print Excel reports	TBD				
System must summarize or otherwise reduce data into meaningful statistics	TBD				