Goal: Develop a module control system that has the ability to measure time delay between commanded signal to full valve actuation for a specified number of cycles for cut/clamp/feed. Mean average and standard deviation are reported for each lane.

Possible issues:

1. Calibrating the sensor time vs the full actuation time
2. Air reservoir should probably be present to ensure consistent results
3. Must attempt to standardize pneumatic tube lengths to not affect results.

Basic Process:

1. Module is mechanically inserted into the test bench
2. User specifies number of trials
3. C# application confirms via some proximity switches whether the modules are locked in place
4. Modules cycle through and time to fully actuate cut/clamp is measured.
5. Mean standard deviation of actuation, pressures are all measured and stored
6. Display histogram, and any errors.

Candidate data loggers:

3x DI-4208 (3 connected to a USB hub to synchronize logging). C# class included.

<https://www.dataq.com/products/di-4208/>

Candidate sensors:

Slot type sensors:

<http://www.ia.omron.com/products/category/sensors/photomicro-sensors/slot-type/index.html>