

Automated Applicator Reliability Test Fixture

Problem Statement

An unreleased Dexcom device requires verification testing to ensure the quality and reliability of the product in order to pass FDA inspection and go to market. This testing is currently being performed by hand. In order to reduce the time and cost of this testing, Dexcom is pursuing an automated applicator reliability test fixture.

Objective

To design, build, & test an automated applicator reliability test fixture that reduces testing time while accurately simulating the conditions the device is expected to experience in its lifetime. The test fixture must test the device through 100 cycles of testing and record and display the number of test cycles that have occurred, while maintaining user safety and integrity of the device being tested.

Design

The team went through 5 design iterations driven by prototypes & testing.

Testing & Analysis

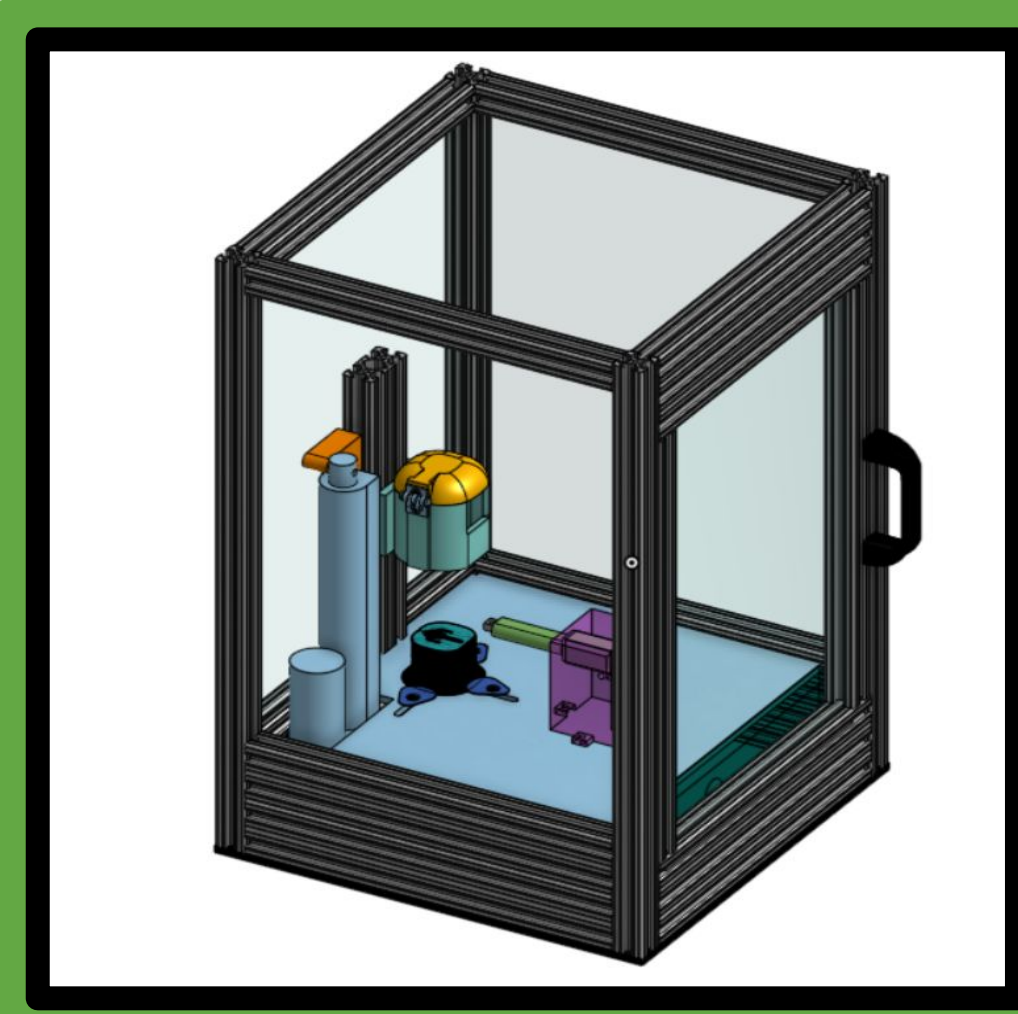
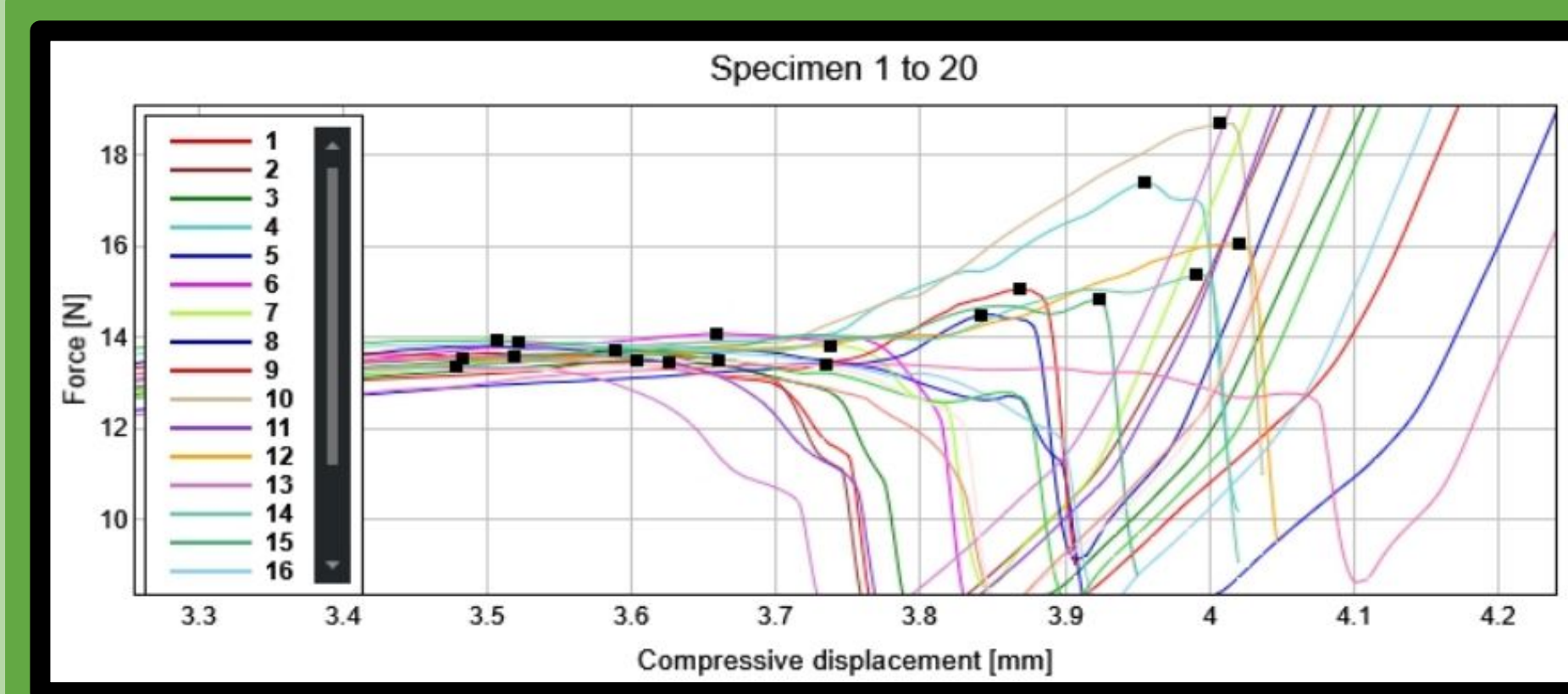
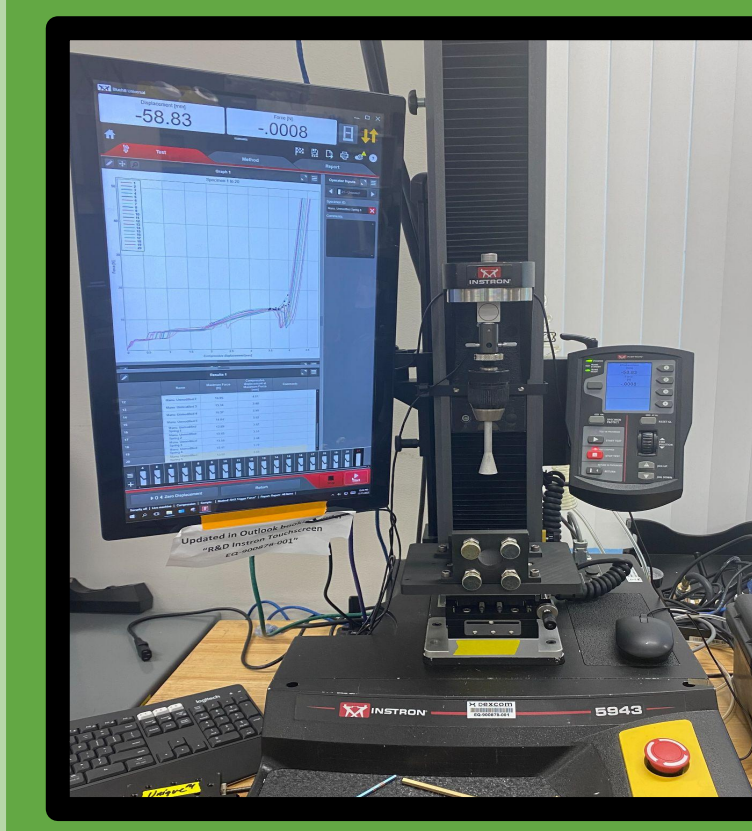
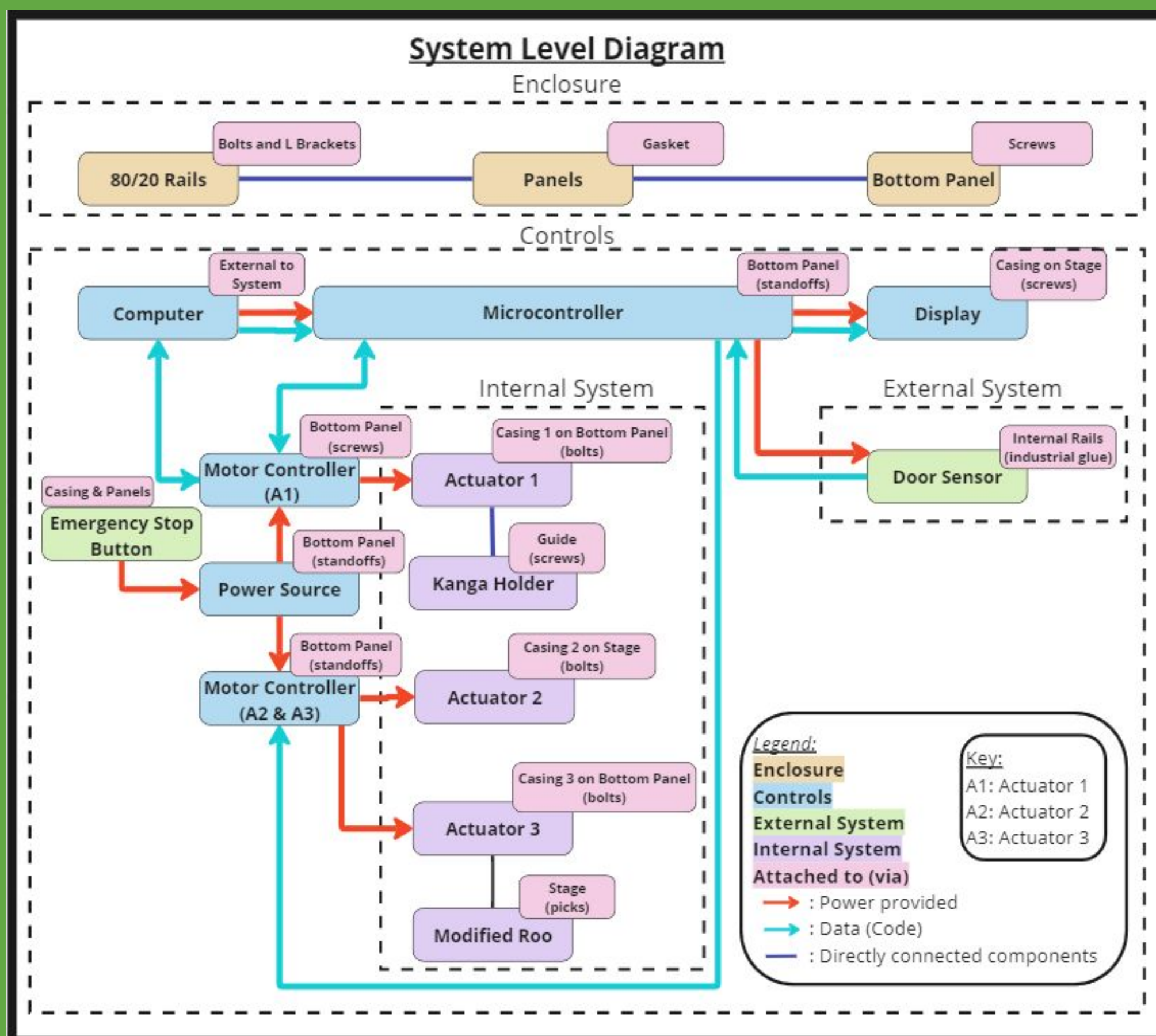
- Force Testing
- Cycle Testing

Manufacturing

- Band Saw
- Waterjet
- CNC Laser Cutting
- 3D Printing

Assembly

- Subsystems
- System Integration



The Team



Karen Lopez-Mendez
Design Lead

Lindsey MacLeod
System Integration

Josmaria Manansala
Electrical Lead

Erin Moore
Team Lead

Miguel Rodriguez
Manufacturing Lead

Acknowledgements

The team would like to thank everyone at Dexcom as well as the following individuals for their support & contributions in the development of our system.

Dexcom

Max Spiegelhoff, Lenny Barbod, Thomas Thompson, and Christina Saucedo

San Diego State University

Dr. Scott Shaffar and Michael Lester