

Objective

- Provide a therapeutic fishing experience for people with spinal cord injuries
- Maximize user independence
- Adapt to different environments & disabilities

Requirements

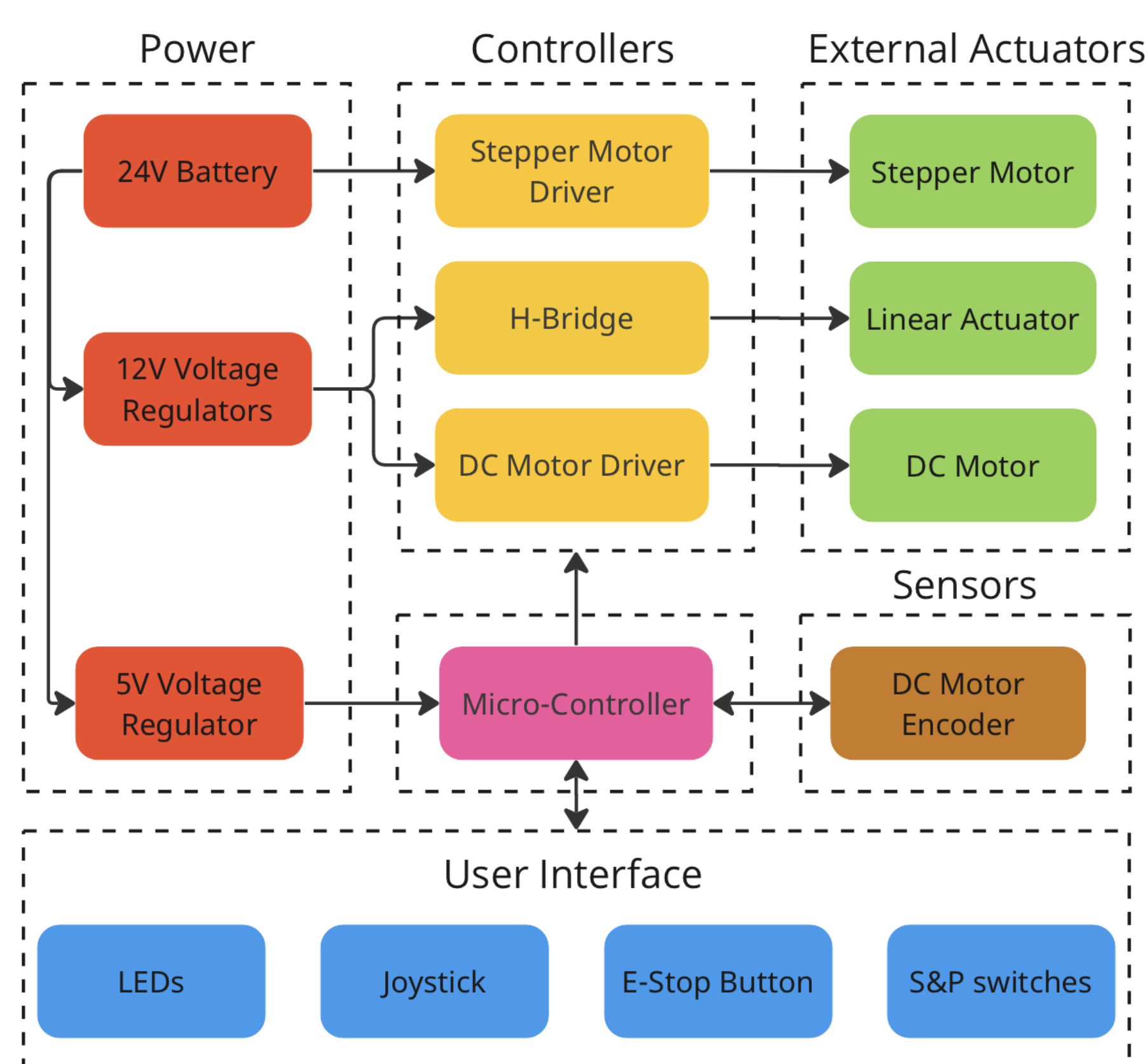
Safe & Robust

- ✓ No electrical or cutting hazards
- ✓ No tipping or slipping during operation
- ✓ Emergency stop
- ✓ 3 Hour battery life
- ✓ Waterproof (IPX4: Splashing All Directions)

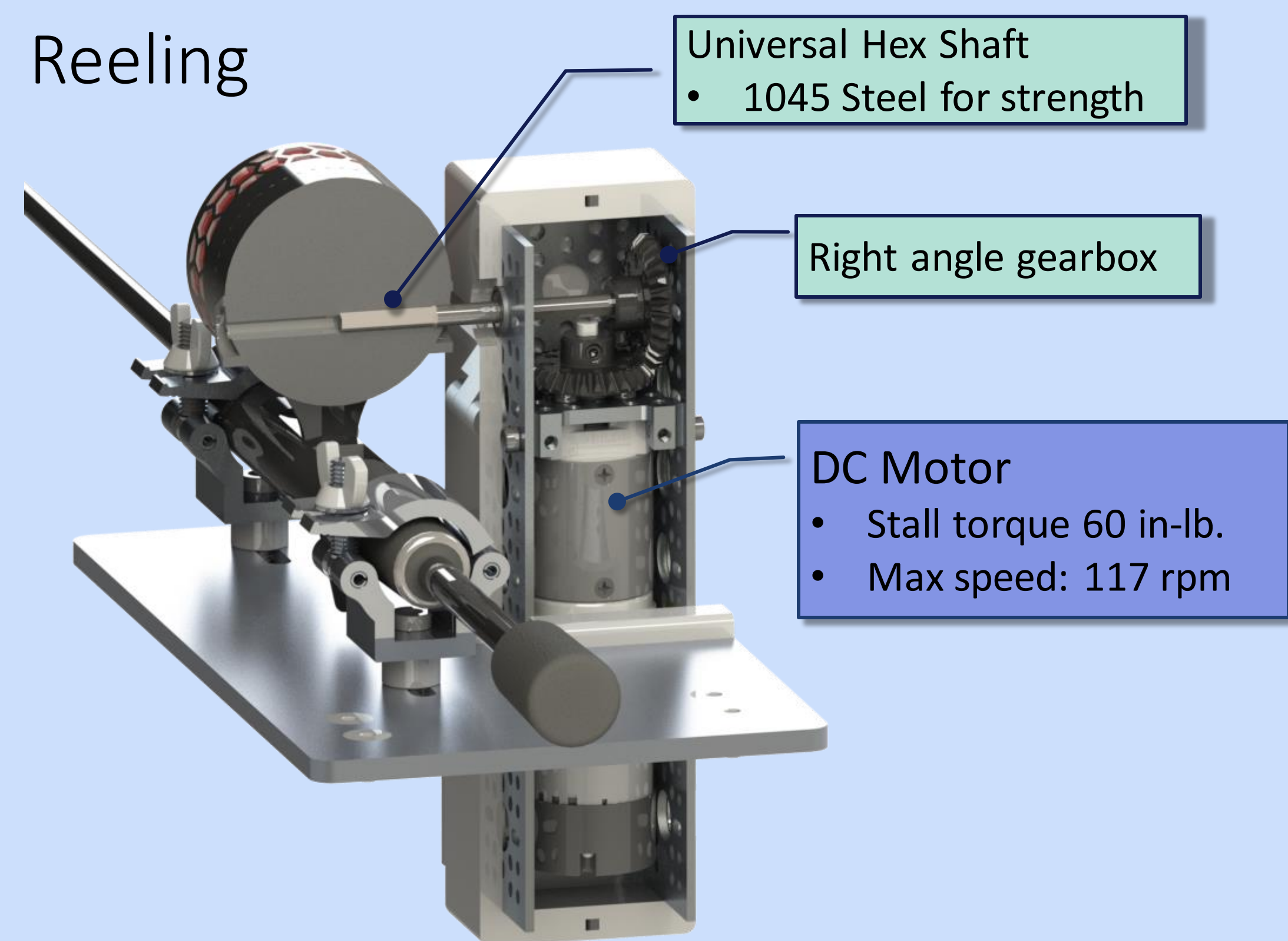
Natural & Easy To Use

- ➔ 10 to 50 ft casting distance
- ✓ 0 to 2.5 mph reeling speed
- ✓ Different commercial rods & reels
- ✓ Set up 15 minutes or less
- ✓ Fits in a car trunk (16"x32"x36")
- ✓ Weighs less than 50 lbs.

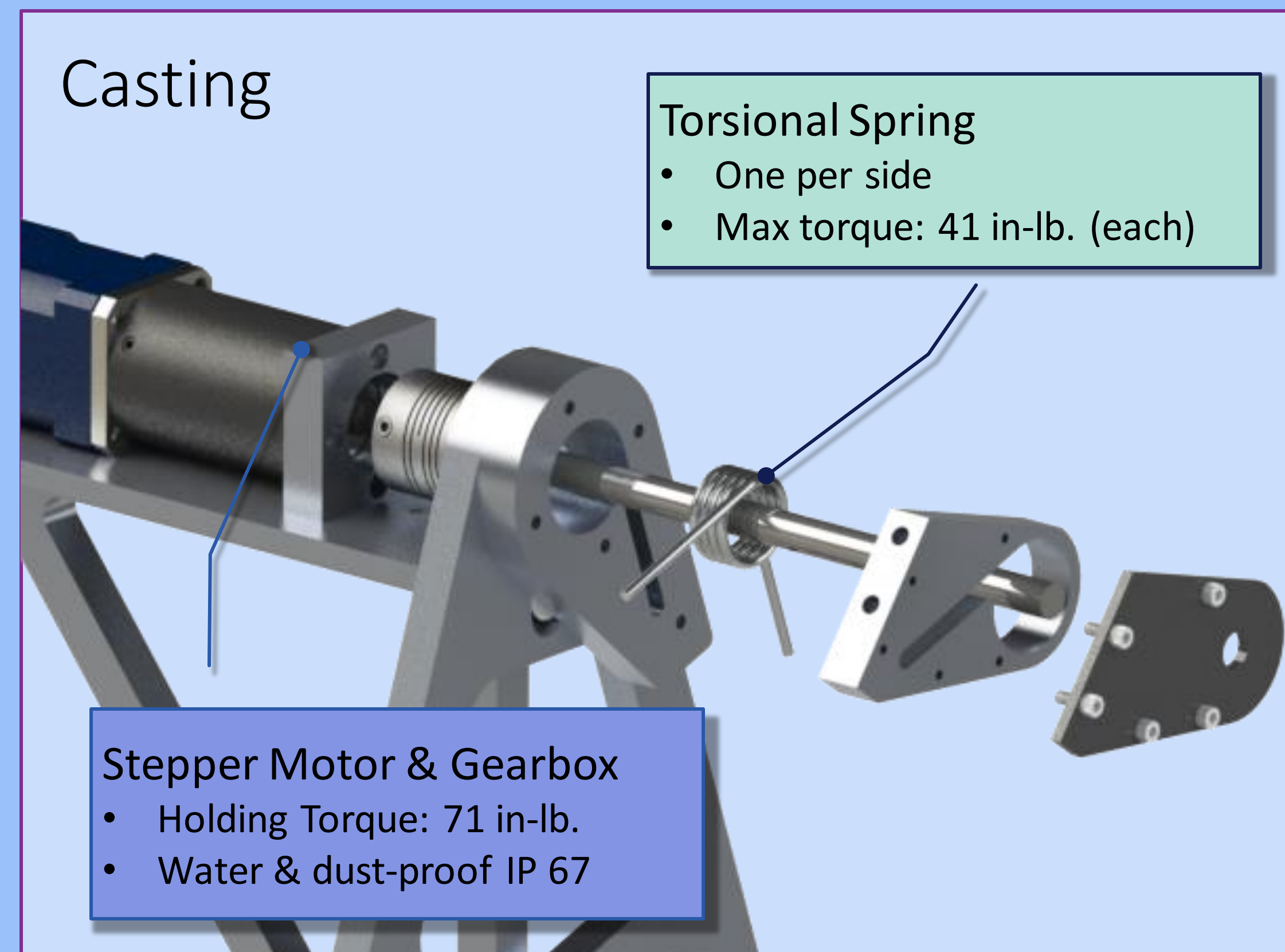
Electrical System



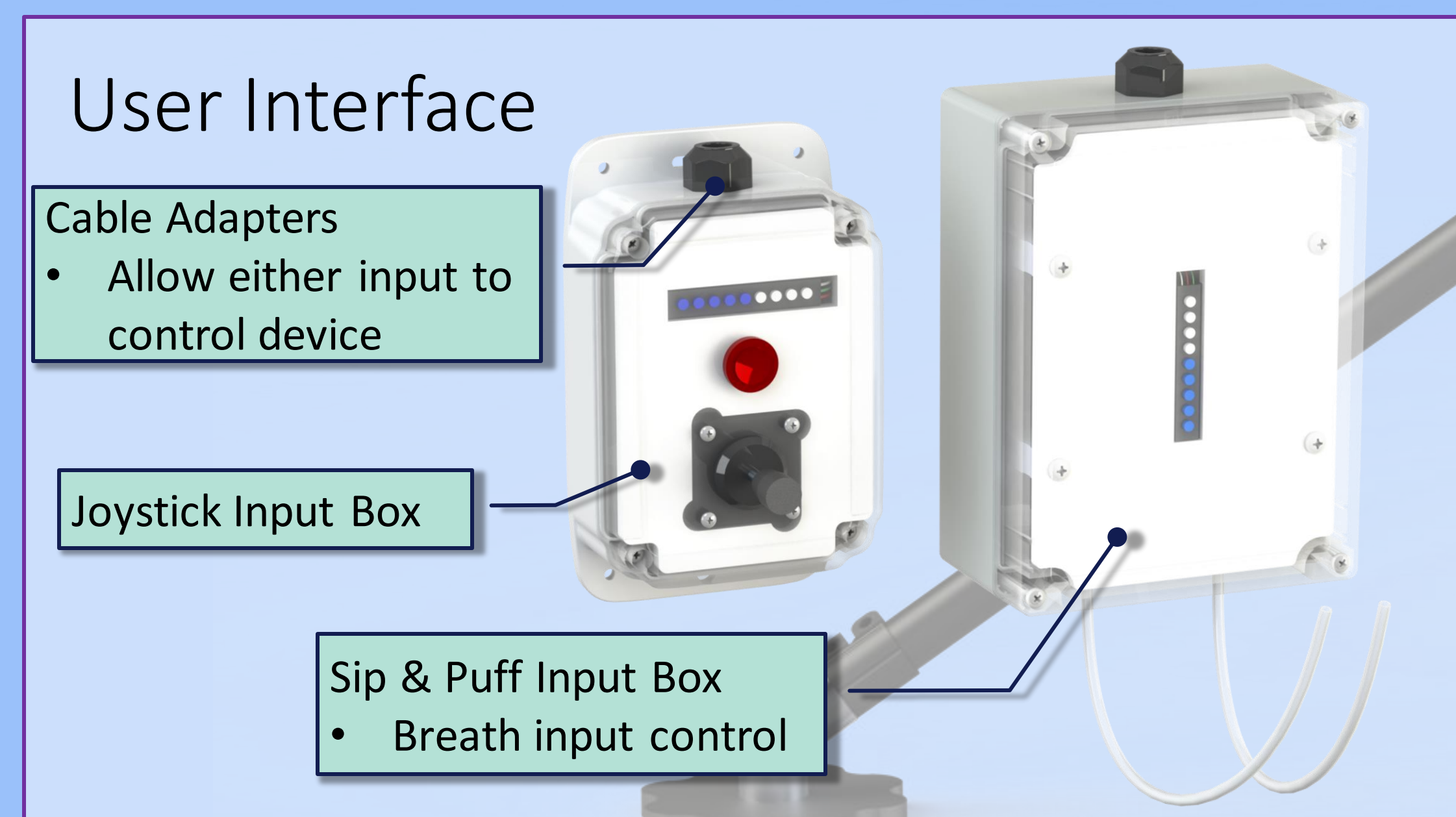
Reeling



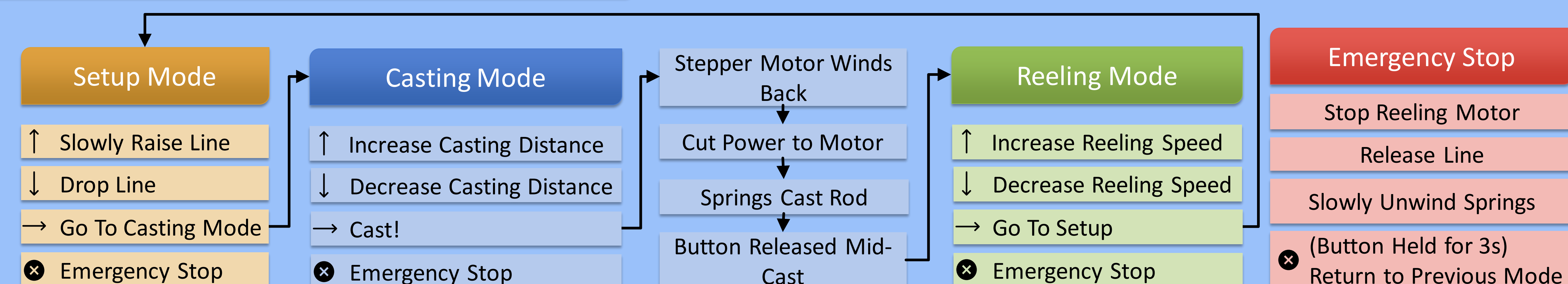
Casting



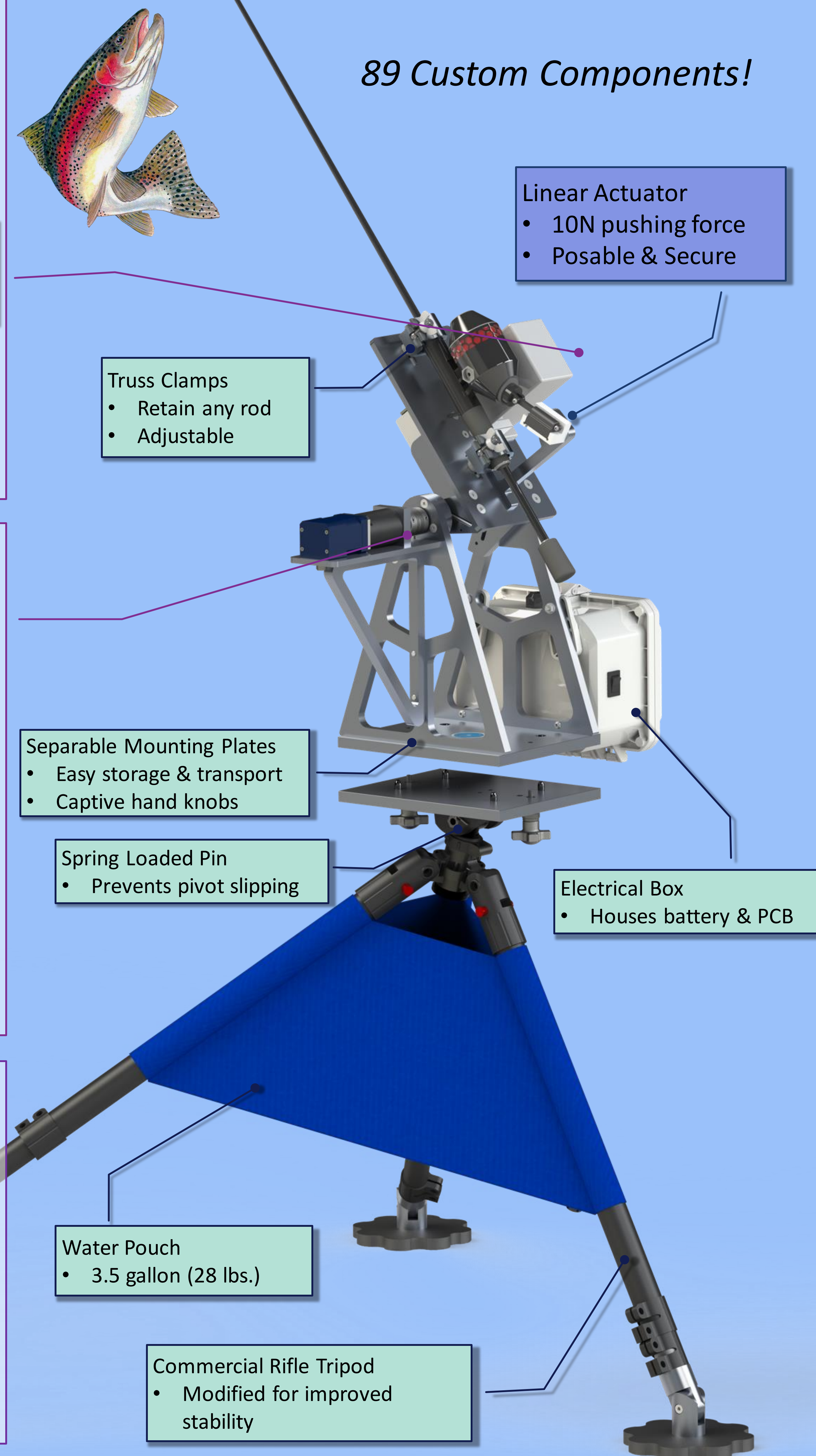
User Interface



Control Flow Diagram



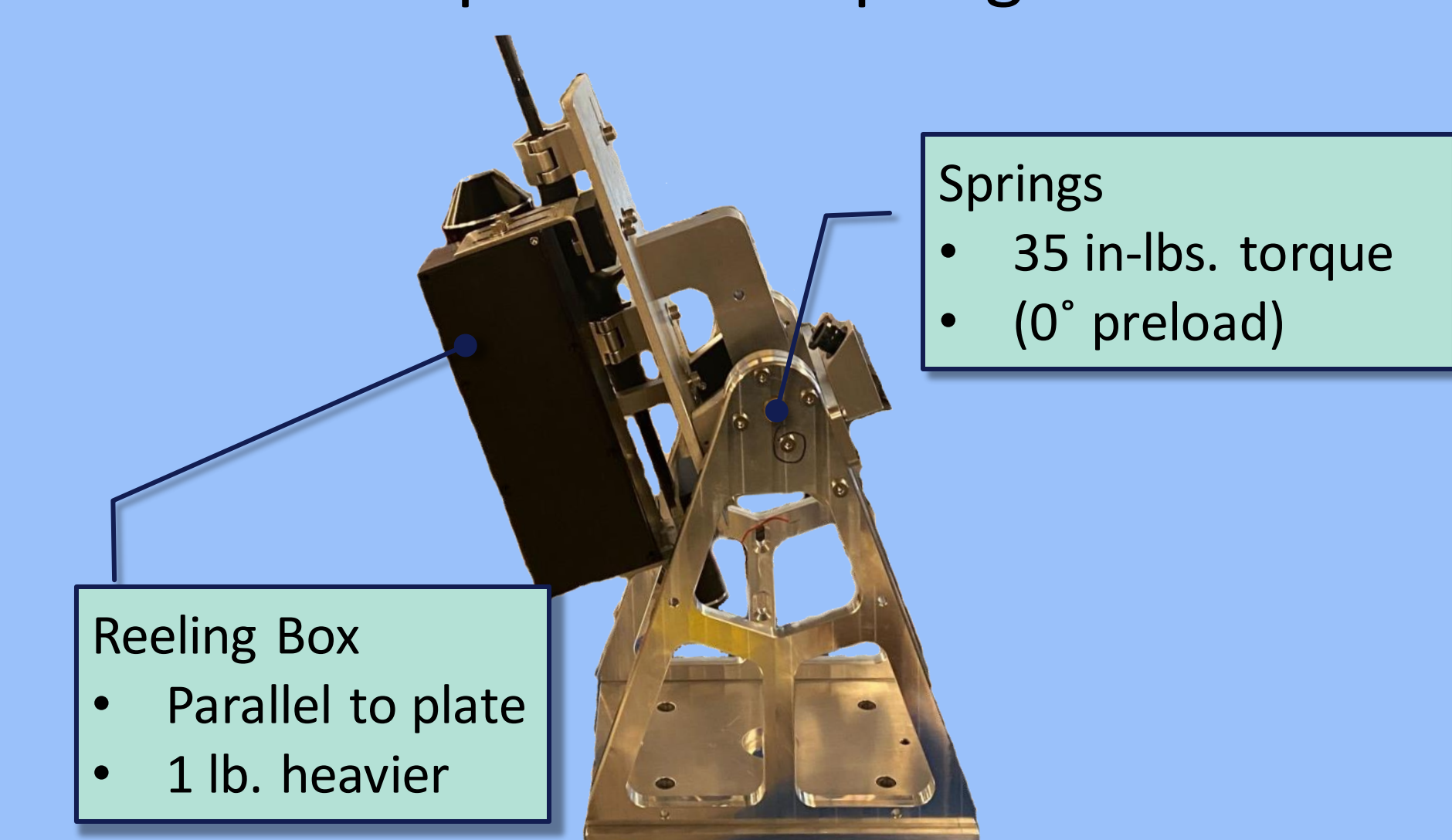
89 Custom Components!



Design Challenges

Original design fell back 40° from intended resting position

- Changed reeling box orientation and added preload to springs

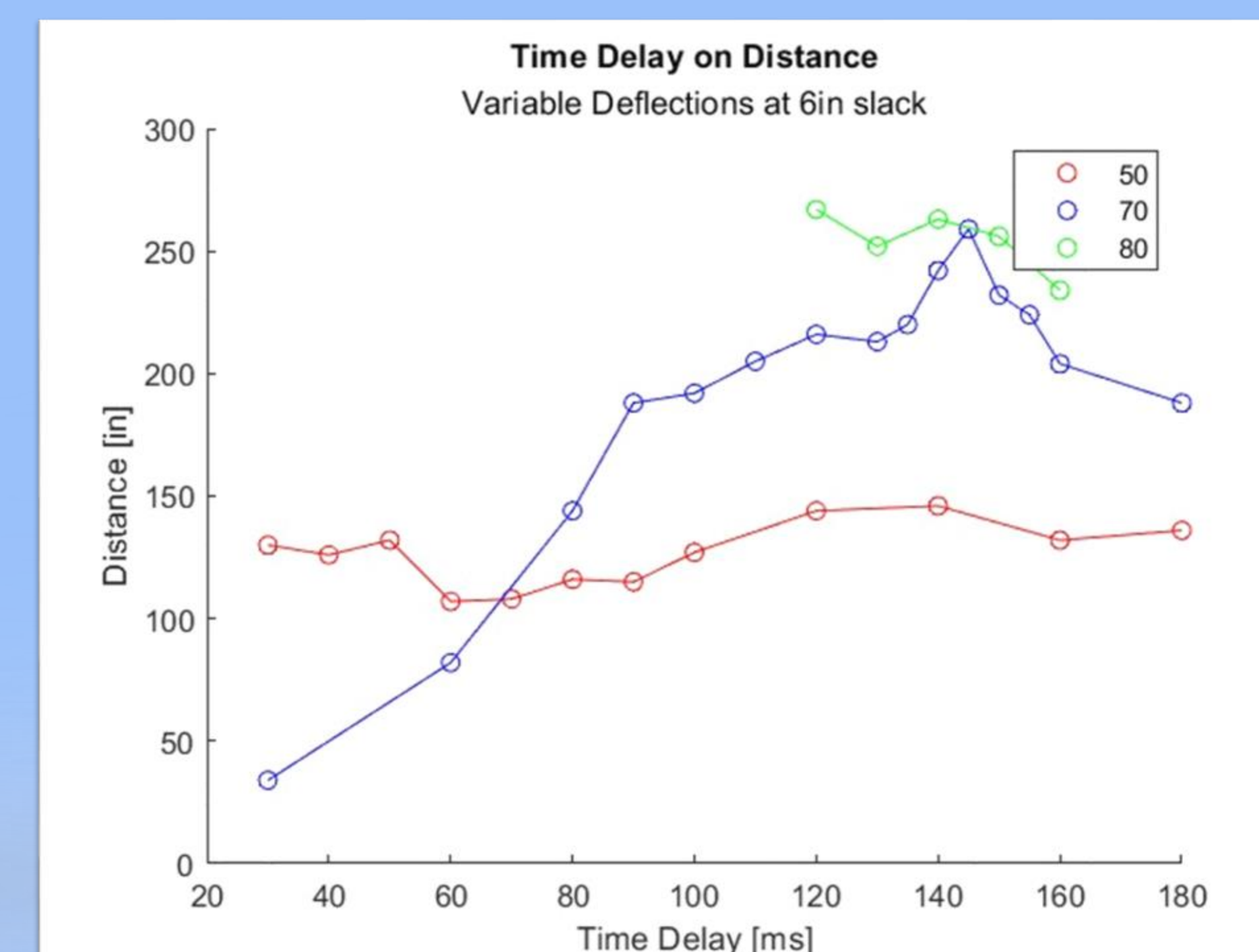


Linear actuator slipped after casting

- New mounting with 2 support points
- Large EMF current generated during cast
- Specialty motor driver & angle limits

Results

- Total Weight: 36 lbs.
- Cost: \$2,400 (+ \$375 in donations)
- Max distance: 26 ft



Impact

- Will be used by many at River Deep Foundation & Craig Hospital
- Gives independence to people with spinal cord injuries
- Helps veterans & first responders relax & connect