Weld Optimization

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TEAM 2

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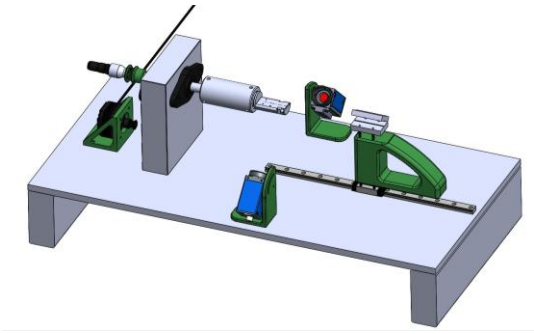
PROJECT BACKGROUND & DESIGN GOAL:

TE Connectivity Medical manufactures small, high-precision components used in minimally invasive medical devices. The current welding process for these assemblies is time-intensive and requires precise operator handling, which can limit production efficiency and consistency.

The goal of this project is to design and implement an improved welding fixture that reduces assembly time, increases repeatability, and adheres to strict quality requirements for medical device components. The final design aims to streamline the welding process while ensuring alignment accuracy and minimizing operator variability.

DESIGN OUTCOMES:

- Reduced assembly cycle time by approximately 34 seconds per part
- Increased production rate by approximately 11 units per hour
- Improved alignment and consistency of welded components
- Reduced reliance on individual operators through fixture-guided positioning
- Maintained compliance with medical manufacturing quality standards
- Estimated cost savings of $0.47 per part with a ROI of 250% in one year.



Simplified model of design

DESIGN CONSTRAINTS:

- **Precision requirements:** Must maintain tight tolerances required for medical device components involved (approximately the width of a human hair)
- **Material compatibility:** Fixture must withstand welding conditions without degrading
- **Ergonomics:** Design must be easy and safe for operators to use repeatedly
- **Manufacturing integration:** Must fit within existing production setup at TE Connectivity
- **Cost limitations:** Initial investment must be justified by long-term savings
- **Quality assurance:** Must not introduce defects or variability into the welding process