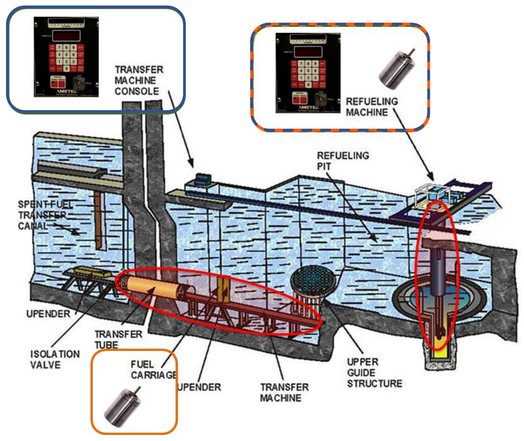
Modernized Programmable Limit Switch (PLS) for Nuclear Power Plant Fuel Transport

Stuart D'Amico, Rachel Newcomb, Kathryn Sebastian, Zach Sharp, Tristan Tibbs

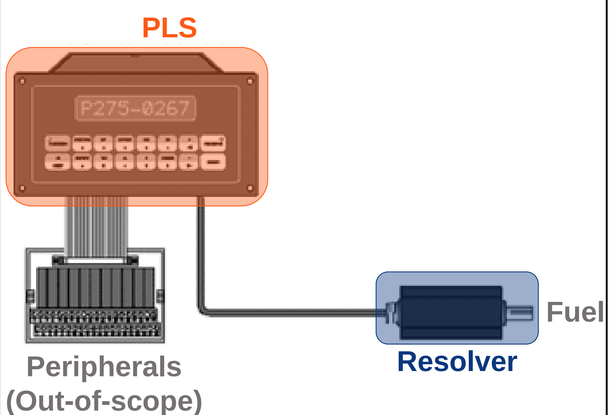
Instructor: Bobby Compton | Technical Mentor: Jim Toms | Executive Sponsor: Alan Thomas

Project Background

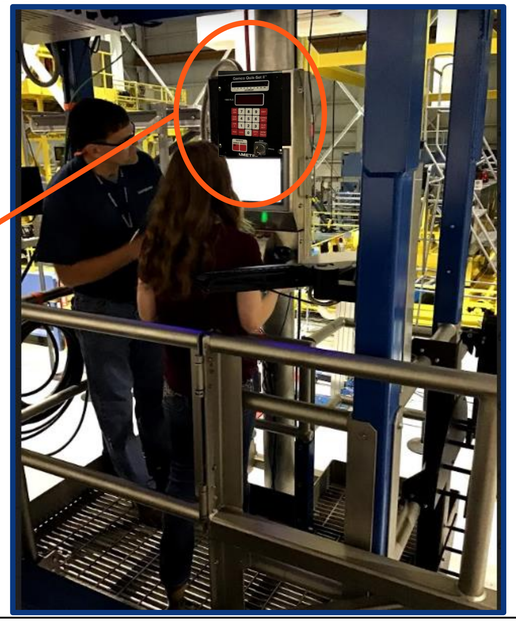


Problem Statement

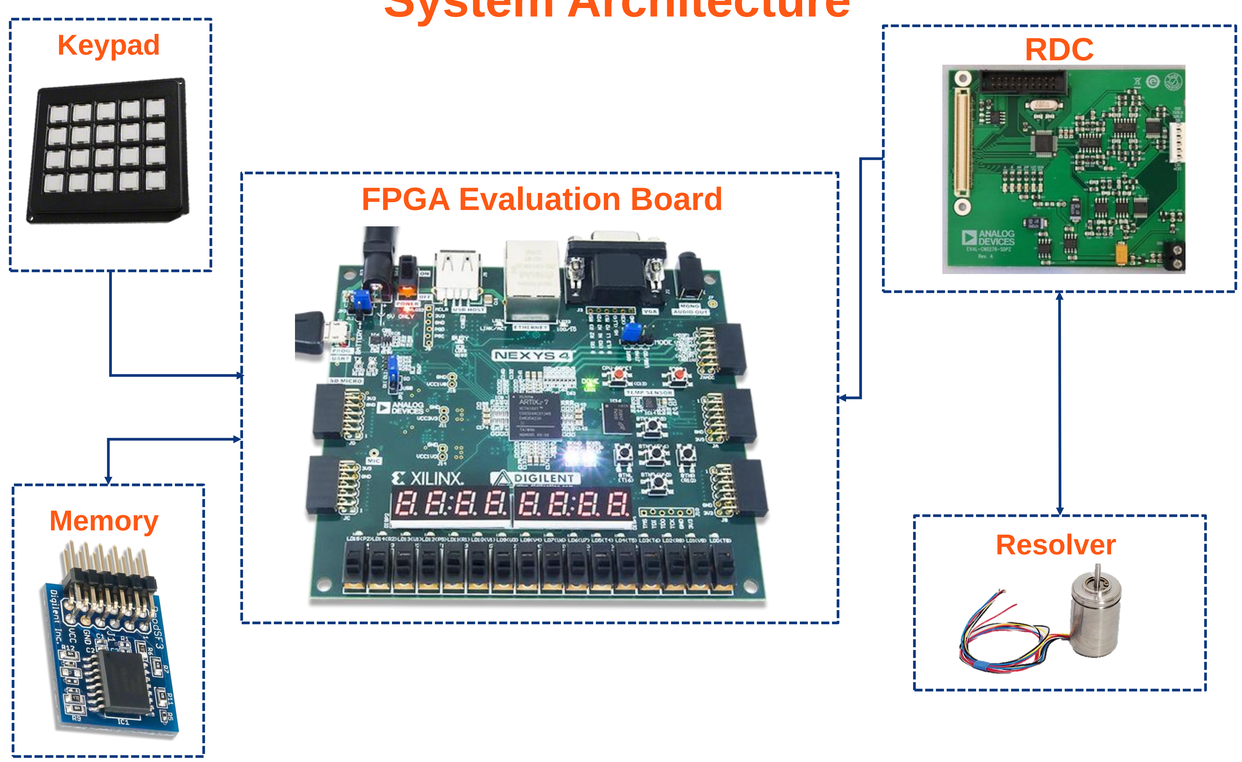
Design an FPGA-based device as an equivalent replacement for the obsolete PLS unit used in the fuel transfer system of nuclear power plants



User Interaction



System Architecture



Requirements

- Use a Xilinx FPGA
- Measure an object's angular position
- Output feedback to seven-segment display
- Offer up to 100 user-programmable setpoints
- Recover previous contents from memory after outage

Technical Achievements

- Synchronizing RDC output with FPGA
- Programming RDC parameters from FPGA
- Synthesizing with Block RAM
- Accessing separate memory component

Future Steps

- RDC Configurability
- Custom PCB and packaging