



Laser Control GUI

Optical Engines, Inc develops high power laser systems, performs cutting edge R&D for leading scientific firms and universities, and delivers high quality custom fiber devices. We create exceptional solutions with hardware and software hand in hand. Our current GUI that controls our laser systems has gone through many revisions over the years and it is time for another one. This revision is a change of framework and general maintenance improvement. It includes a change to the style to match other more recent projects developed by Optical Engines, Inc. And you'll get to work with lasers!

The Project

The screenshot displays the 'Optical Engines' software interface. At the top, there are menu options for 'Connections', 'Tools', and 'Uptime'. The main area is divided into several sections:

- Laser Controllers:** A table with columns for Serial Num, Interlock, Pilot, Status, Set Point, Power, and Temp. It lists controllers 3120, 3067, and 3068, along with a 'Group Ctrl' row. All status indicators show a red 'X'.
- Power Display:** Shows '0.00 W' with a red 'X' icon. A message box states: 'The laser cannot be enabled right now. Global: The safety interlock is active.'
- Control Panel:** Includes a 'Control' section with an 'External Control' checkbox and an 'Interlock Status' indicator (yellow square). A 'Clear Interlock' button is present.
- Laser Diodes:** A table with columns for Name, Status, and Set Point. It lists PreAmp 1, PreAmp 2, Output Power, and five Pump units. All status indicators show a red 'X'.
- Sensors:** A table with columns for Name and Value. It lists LD Temp, Case Temp, Stage0 Input, Stage1 Input, Stage2 Input, Reverse Power (3094 W), Analog Input, and Scatter Detected (0 X).

Current (Version 5.2.0) of the Laser Control GUI

Objectives

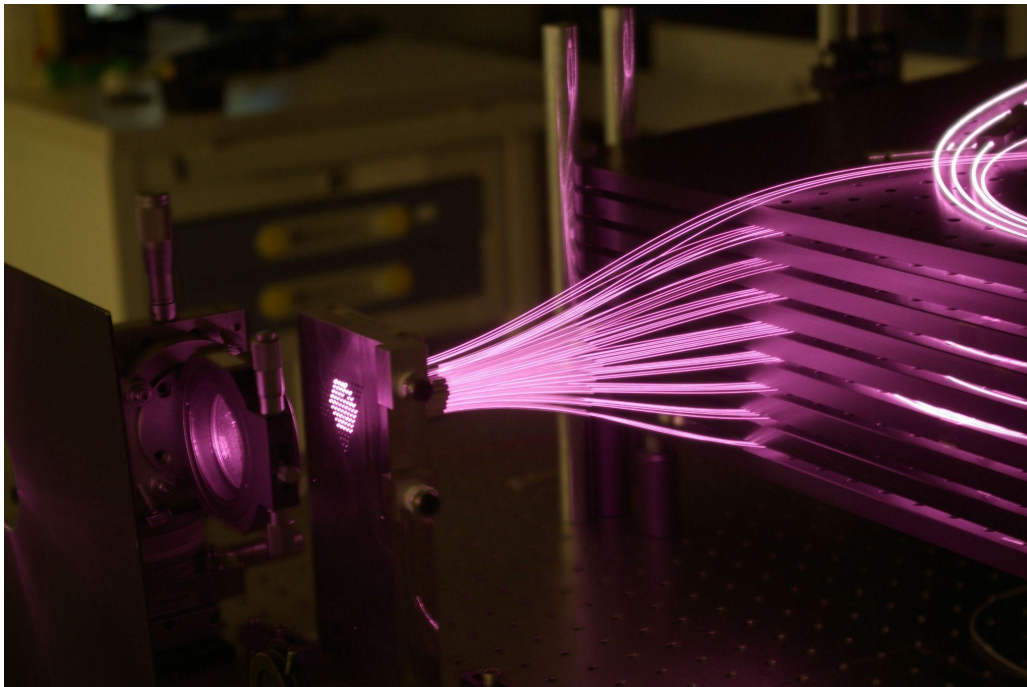
- Recreate functionality of current Laser Control GUI
- Improve current logging capabilities
- Create a resolution-aware and DPI-aware desktop application
- Selective backwards compatibility with older Laser Control firmware
- Match style of newer GUI development (picture below)
- Reach Goal: Integrated arbitrary pulse generator

Learning

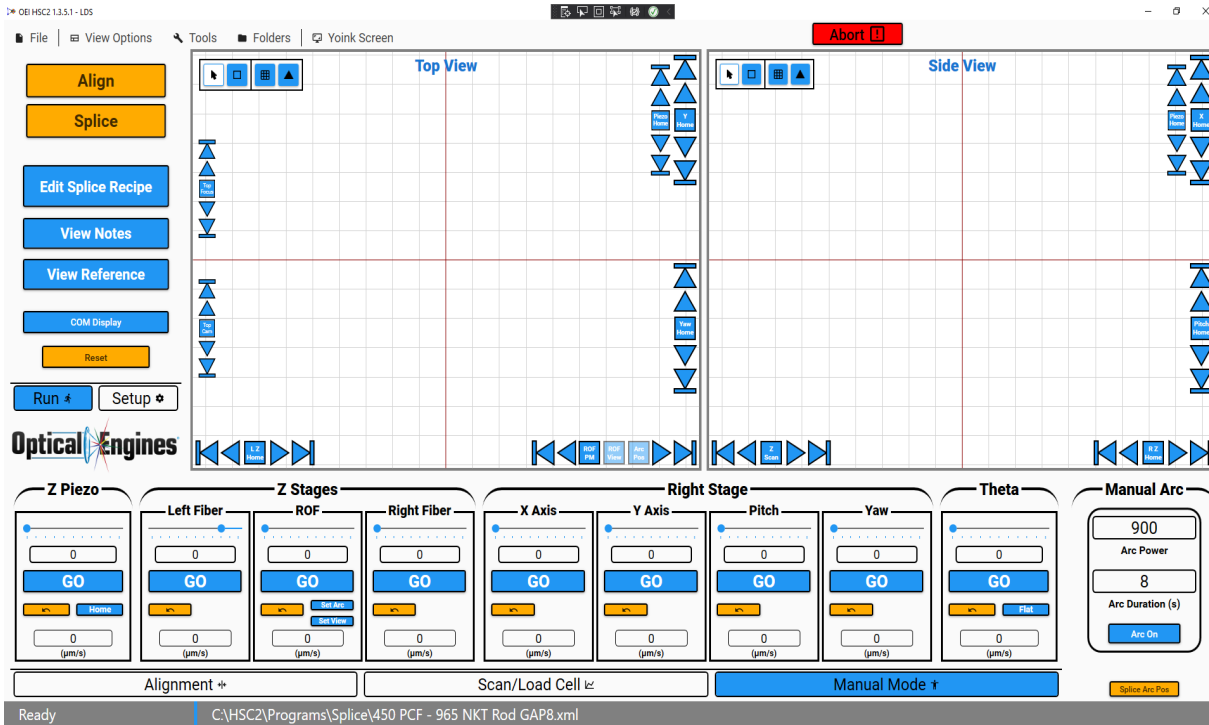
- Technologies
 - C#
 - WPF
 - Windows
 - High Power Fiber Lasers!
- GitHub with CI
- Test Driven Development with MSTest unit tests

Details

- Preferred team size: 3-5 students
- Potential for student internship(s)
- Work performed remotely and some on-site in Colorado Springs



A Laser System output



Existing GUI (style example)