Dispensing Test Station

Printed Circuit Board Assembly Test Fixture

SDSU | San Diego State University

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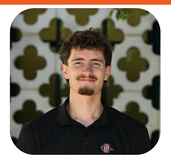
BD

Project Overview

At Becton Dickinson, the current set up for preparing a printed circuit board assembly (PCBA) for testing takes 15-20 minutes, leading to a time consuming validation process. Additionally, the PCBA remains connected to its host equipment instead of using a simulated load during testing, making the system susceptible to overloading, and making it difficult to diagnose the problem for nonfunctional PCBAs since it is harder to replicate test conditions.

This is Phase 2 of the Dispensing Test Station. Our focus for this project is to design a reliable test fixture to make testing more efficient since Phase 1 completed the structure to house the testing equipment.

Meet the Team



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Jacob Butcher
ECE Lead

Samantha Castellanos
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Kaye-Angeli Delacruz
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Trek Hugg
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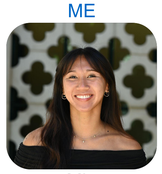
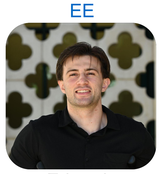


Mia Sevidal
ME



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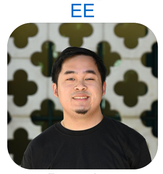

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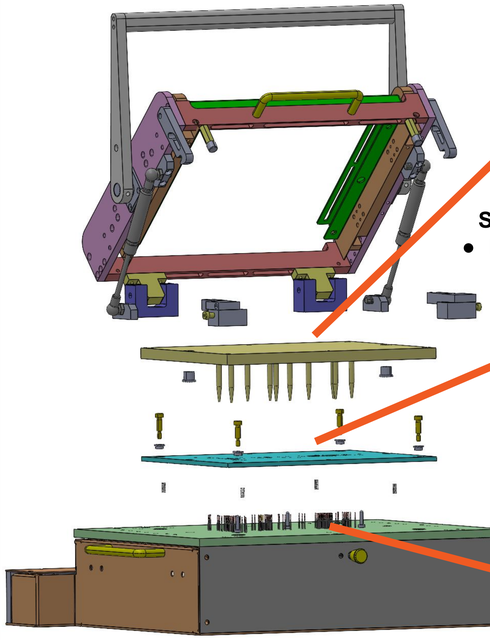
Mechanical Design

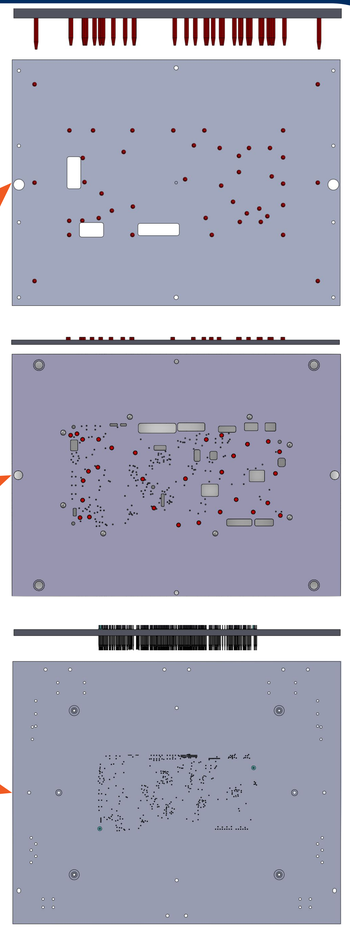


Exploded View of Fixture

Push Plate
- Finger Probes

Stripper Plate
- Board Stops

Pin Plate
- Locator Pins
- Pogo Pins



Testing Interface

LabVIEW State Machine Flowchart

Initialize
- Open Instrument Communication
- Initialize Power Supply
- Initialize AD3 (DMM, Function Generator, Waveform Generator, Oscilloscope)
- Verify Power Rails

Configure/Idle
- Configure Test Settings
- Set Power Supply Limits
- Configure Relay Matrix
- Select Test Mode
- Wait for Start/Exit

Start

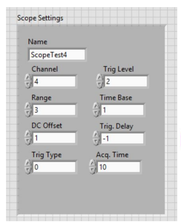
Execute Test /Acquire
- Acquire Measurements
- Pass/Fail Evaluation
- Log Data with Timestamp
- Save Results to Excel File

Close
- Close Instrument Communications
- Disable All Outputs
- Reset Instruments
- Return Relay Matrix to Default
- Close Log Session

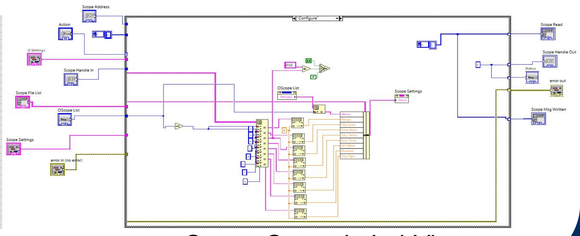
Error Case

Exit

Error Handling
- Log Error Message
- Set Safe Outputs
- Return to Configure/Idle



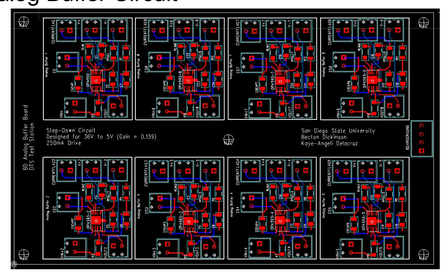
Scope Settings



Scope Cases in LabView

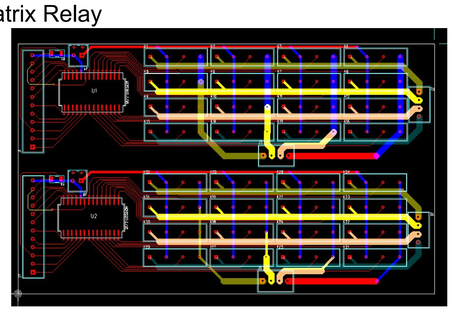
PCB Layout

Analog Buffer Circuit

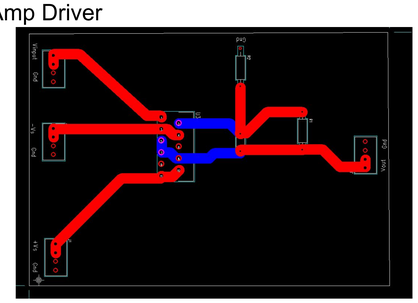


Analog Output Circuit

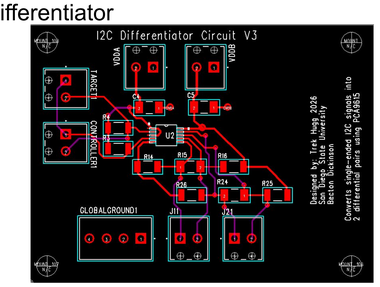
Matrix Relay



10 Amp Driver



I^2C Differentiator



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