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Tray Stacker and Destacker (TSD)

San Diego State University

Motor driver Arduino Due Microcontrolle

LED status light

5v Power suppl

Loading Mechanism

Fastner connection

LED screen

Aluminum

Mechanical connecti Electrical connection

Systems Level Diagram

Electronics

Bearing Mount for Lead Screw Stepper moto

Lead screw Shaft coupling

24V Power supply

Created by STAX Engineering and Team Sostratous Sponsored Masimosimo

The Project

The Stax Engineering team, along with the sponsorship of Masimo, has developed the Automated Tray Tacker & De-stacker with the intent to improve the efficiency of Masimo's production line. The machine's design is similar to a 3D printer, where it utilizes rotational motion and converts it into linear motion through





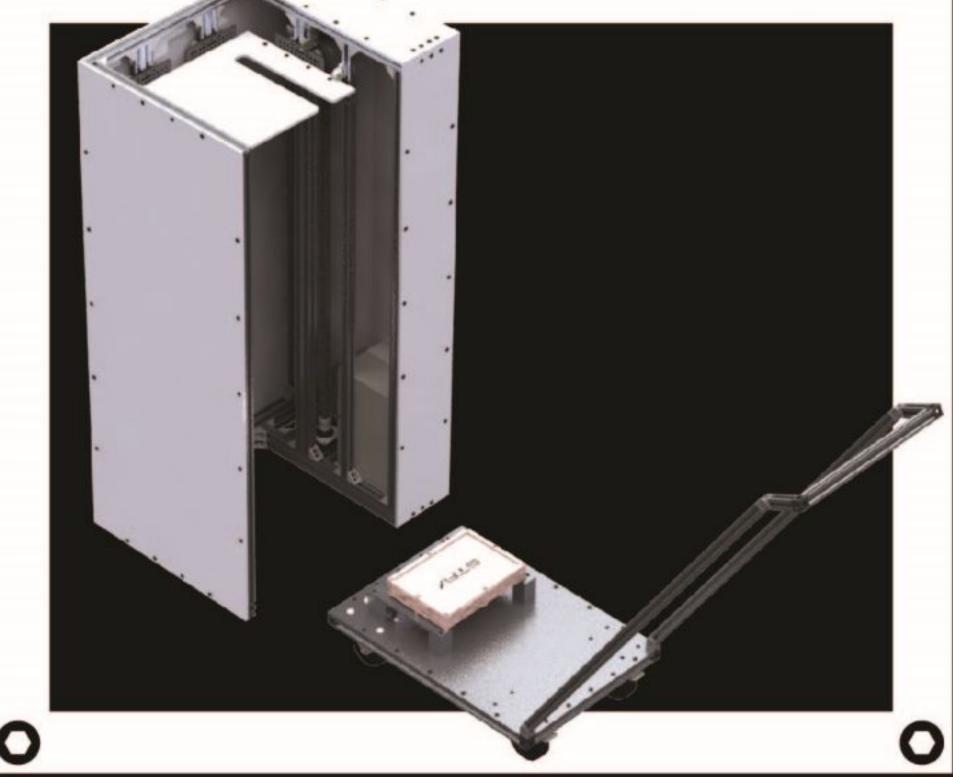




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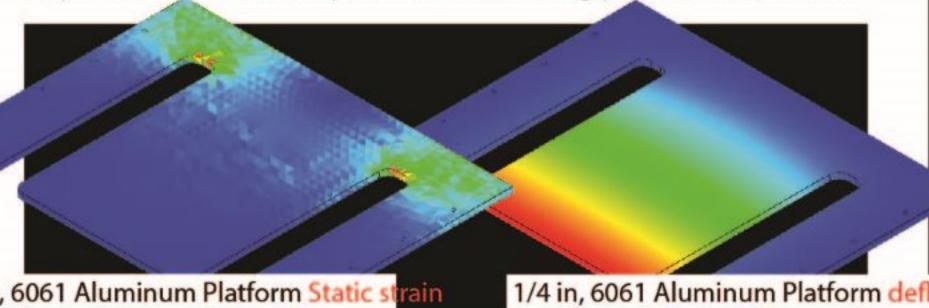
Tray Stacker and DeStacker(TSI



Structure/Housing Aluminum V-slot beam (Pillars) luminum Platfori for trays Lifting Mechanism

ENGINEERING ANALYSIS

Engineering analysis was conducted on the platform, which, is intended to hold a maximum of 100 N of force. Several different material options such as 7075 and 6061 aluminum in both 1/8 inch and 1/4 inch thickness were subject to Solidworks finite element analysis in order to determine the best possible material and thickness combination to support the maximum load of trays. The factor of safety was also accordingly calculated, which



1/4 in, 6061 Aluminum Platform deflection FEA

THE TEAM Joel Osuna Kevin Usa lan Estacio Steven Magayar Karim Omara Ali Al-Azmi Chaitanya Pat Alejandro Ort Saud Alutairi