



Company Information

Company Name	<i>Legrand – Pass & Seymour</i>	Date Submitted	<i>11/09/2021</i>
Project Title	<i>Design of a Universal Robotic Work Cell Buffer (LEG_BUFFER)</i>	Planned Starting Semester	<i>Spring 2022</i>

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

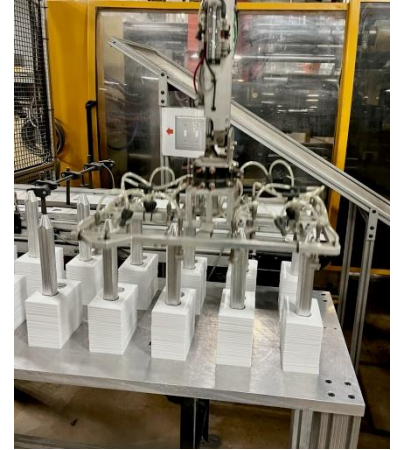
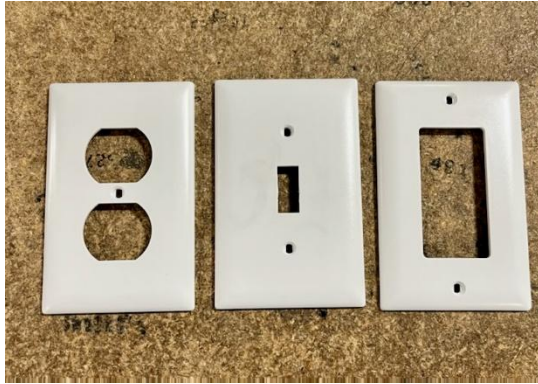
Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	4	Electrical	0
Computer	0-1	Systems	0
Other ()	0		

Company and Project Overview:

Legrand is the largest electrical wiring device company in the world. Here at the Concord plant, we manufacture thermoplastic wallplates that are found throughout residential construction.

This project will attempt to create a universal buffer that can hold a variety of wallplates that come out of our injection molding machines. A universal buffer will allow us to move our molds around to multiple presses to help maximize uptime and flexibility to meet growing volume needs. Our current buffers can only store one type of wallplate which make our lines less flexible. We have 15 molding machines that we ultimately want to equip universal buffers to.



Project Requirements:

This project will require the team to evaluate the current limited buffer table, evaluate our multiple plate configurations and figure out how to design a buffer configuration that allows us to stack any of the plate configurations on the table with no or minimal changeover.

The wallplates are currently placed on the table vertically by a robot removing wallplates from an injection molding machine. The plates are stacked and have either a center post or outside posts coming up from the table to keep the stacks captured and stable. As the downstream equipment frees up, the robot pulls plates from the buffer and sends them down a conveyor to be packed. Currently, the buffer can only hold one type of plate. If we run another mold in the press, we have to send them out the back of the press and hand load them onto the packaging equipment. A universal buffer would allow for multiple plates to be stacked with little to no adjustment depending on what the team designs.

The buffer should hold a minimum of 10 minutes of plates with as many as possible preferred.

Expected Deliverables/Results:

- Solid Works Models and 2-D drawings of a universal full scale buffer table.
- Build full scale prototype that we can test on one of our lines.
- Work with our engineers to program robot to pick and place from the prototype.
- Pilot the prototype on our production line to show proof of concept (can be in non-production walk through mode).

Disposition of Deliverables at the End of the Project:



We would expect the prototype be tested and videoed onsite to provide video evidence of project at Expo. Prototype could be shown at expo but would not be able to be shown in action. We could supply product for expo as samples for display on the buffer table. We would want the prototype back at the end of the Expo per your normal rules.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (if none please state none):

- Metal fabrication skills.
- Solidworks 3D modeling skills
- 80/20 assembly knowledge or metal cutting a plus.
- Electrical Controls (solution could be mechanical or electro-mechanical)