

# System Design for Pot-pulator

Team #24, The Nursery Project

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# 1 Revision History

Date	Version	Notes
2023-01-18	Juan Moncada, Aaron Billones, Steven Ramundi, Gillian Ford	Initial release

## 2 Reference Material

This section records information for easy reference.

### 2.1 Abbreviations and Acronyms

symbol	description
ProgName	Explanation of program name
<a href="#">[... —SS]</a>	<a href="#">[... —SS]</a>

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### **3 Introduction**

The Pot-pulator is a machine with purpose of aiding Sheridan Nurseries in populating their trays with pots, in order to prepare them for filling with soil and seeds.

Their current method of populating the trays with pots is a process with little to no automation, requiring many manual hours of labour. Each year, 250,000 annual plants need to be produced by the nursery. Recently, the supervisors have found it increasingly more difficult to fill positions with enough workers to run the operation smoothly and meet production demand. The Pot-pulator will alleviate the large reliance on manual labour and improve the overall efficiency of the nursery.

This document consists of a detailed design overview of the Pot-pulator. The system overview, system variables, user interfaces, hardware design and electrical design will be presented in this document.

### **4 Purpose**

This document describes the overall system functionality and the design overview of the Pot-pulator. It will describe how the mechanical, electrical, and software components will interact with each other, and the various design decisions made within the system. The Module Guide (MG) and Module Interface Specification (MIS) are additional design documents that provide a further in depth design of the components in each module of the system.

### **5 Scope**

The following figure shows the boundary between the Pot-pulator device and its functionality within the given environment.

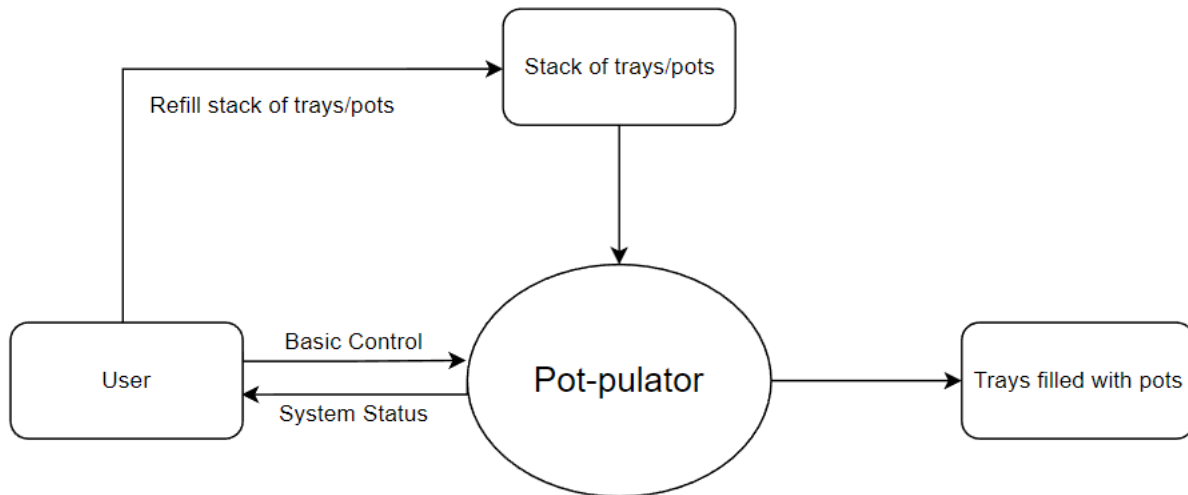


Figure 1: System Context Diagram

## 6 Project Overview

### 6.1 Normal Behaviour

### 6.2 Undesired Event Handling

[How you will approach undesired events —SS]

### 6.3 Component Diagram

### 6.4 Connection Between Requirements and Design

[The intention of this section is to document decisions that are made “between” the requirements and the design. To satisfy some requirements, design decisions need to be made. Rather than make these decisions implicit, they are explicitly recorded here. For instance, if a program has security requirements, a specific design decision may be made to satisfy those requirements with a password. —SS]

## 7 System Variables

[Include this section for Mechatronics projects —SS]

## **7.1 Monitored Variables**

## **7.2 Controlled Variables**

## **7.3 Constants Variables**

# **8 User Interfaces**

[Design of user interface for software and hardware. Attach an appendix if needed. Drawings, Sketches, Figma —SS]

# **9 Design of Hardware**

[Most relevant for mechatronics projects —SS] [Show what will be acquired —SS] [Show what will be built, with detail on fabrication and materials —SS] [Include appendices as appropriate, possibly with sketches, drawings, CAD, etc —SS]

# **10 Design of Electrical Components**

[Most relevant for mechatronics projects —SS] [Show what will be acquired —SS] [Show what will be built, with detail on fabrication and materials —SS] [Include appendices as appropriate, possibly with sketches, drawings, circuit diagrams, etc —SS]

# **11 Design of Communication Protocols**

[If appropriate —SS]

# **12 Timeline**

[Schedule of tasks and who is responsible —SS]



## **A Interface**

[Include additional information related to the appearance of, and interaction with, the user interface —SS]

## **B Mechanical Hardware**

## **C Electrical Components**

## **D Communication Protocols**

## **E Reflection**

The information in this section will be used to evaluate the team members on the graduate attribute of Problem Analysis and Design. Please answer the following questions:

1. What are the limitations of your solution? Put another way, given unlimited resources, what could you do to make the project better? (LO\_ProbSolutions)
2. Give a brief overview of other design solutions you considered. What are the benefits and tradeoffs of those other designs compared with the chosen design? From all the potential options, why did you select documented design? (LO\_Explores)