Robotic Sorting System

Pace Dominy

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**Interface Control Document**

**Android Application**

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Interface Control Document

for

Robotic Sorting System (Android Application)

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# Overview

This Interface Control Document (ICD) for the Android application for the Robotic Sorting System (RSS) details the interfaces of the Android application with the outside world and with other project subsystems. This document focuses in detail on the communication between the Raspberry Pi built into the Robotic Sorting System and the Android application.

Because the physical aspects of the Android device itself (except for those components used in the Bluetooth connection) may vary greatly depending on the user’s choice of Android device, most physical aspects are outside of the scope of this ICD. Because the Android device is not physically attached to the RSS, its physical characteristics are dependent far more on user chose than the technical constraints of the RSS (provided that the device meets the hardware requirements specified in Paragraph 4 of the Android Application Functional System Requirements (AAFSR) document.

# References and Definitions

## References

The following documents, of the exact issue and revision shown, form a part of this specification to the extent specified herein:

|  |  |  |
| --- | --- | --- |
| **Document Number** | **Revision/Release Date** | **Document Title** |
| Bluetooth SIG 5.0 | 5.0/6 December 2016 | Bluetooth Core Specification v5.0 |
| RSS FSR | 1.0/3 October 2022 | Robotic Sorting System Functional System Requirements |
| RSS AAFSR | 1.0/3 October 2022 | Android Application Functional System Requirements |

## Definitions

AAFSR Android Application Functional System Requirements

FSR Functional System Requirements

ICD Interface Control Document

RSS Robotic Sorting System

SIG Special Interest Group

# Physical Interface

As mentioned in Paragraph 1, the Android device is not physically attached to the RSS and is provided separately by the operator. For this reason, the weight and size of Android devices may vary greatly but does not affect the operation of the RSS.

## Device Range

The range of a Bluetooth connection depends on several factors based on the specifications of both Bluetooth systems. Because the specification of the Android device’s Bluetooth system will vary, a blanket connection range for all configurations cannot be determined. However, to ensure basic usability, the Bluetooth connection will be tested to ensure that it is stable at 2 meters from the Raspberry Pi using a Samsung Galaxy Tab S6 Lite.

# Thermal Interface

The thermal interface for the Android device itself will vary depending on the construction of the device that the user provides. The Raspberry Pi on the RSS has a heatsink integrated as detailed in paragraph 4.1 of the project-level ICD.

# Electrical Interface

## Device-Side Electrical Interfaces

The electrical interfaces on the device side, to include the power source and Bluetooth controller, will vary based on the device provided by the user.

## User Control Interface

The Android application serves as the primary user interface for the Robotic Sorting System. It will present, using a GUI based on Google’s Material Design, relevant diagnostic information and a configuration program that pushes different sorting configurations to the RSS. The user will also start and stop sorting from the Android application. For more information, see paragraph 3.1 of the AAFSR.

# Communications / Device Interface Protocols

## Bluetooth

All communication between the Android device and the Raspberry Pi will use Bluetooth 5.0 as outlined in the Bluetooth Core Specification v5.0. The communication will go both ways: configuration information will be pushed to the RSS and diagnostic and weight information will be pushed to the Android device.

## Device Peripheral Interface

The Raspberry Pi will hand the configuration data imported from the Android device off to the Robotic Arm subsystem, which will then configure the controlling logic to match.