



Robotic HMI for ABB Systems

Project Specification for the

Open Source Hardware

Enterprise

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Introduction:

The purpose of this document is to detail the design and implementation goals for an industrial Human Machine Interface(HMI) that is to be executed by the end of the Spring 2024 Semester.

General Description:

The proposed device will be capable of communicating with the robot it is assigned to, as well as have an operable interface to simplify interactions between the operator and device. It will make operating and checking on the robot much easier.

Functional Requirements:

1. The entire device will have design files originated entirely from free and open source software.
2. The HMI Screen will operate without a PLC, thus being cost efficient.
3. The HMI Screen will communicate with the given robot, able to send IO signals back and forth between the devices.
4. The HMI will perform various tasks to be discussed with Sponsor and Test Users.
5. A case will be acquired to protect the HMI and computer.

Value-Added Goals:

1. The HMI will have a customizable display interface.
2. There will be more functions the HMI is able to perform and display, such as robot status, last time since maintenance update, and other useful data.
3. The HMI will be able to physically move the robot, keeping safety procedures in mind.
4. The cause of the issue on Joint 1 will be investigated.
5. The issue with Joint 1 will be fixed.

Rough Timeline:

Requirement 3 will be completed as soon as possible within the semester.

Work Apportionment:

- Work will be distributed equally and appointed as necessary within the team.

Quantification of Functional Requirements:

1. Meeting this requirement will be self-evident.
2. Meeting this requirement will be self-evident.
3. A demonstration will be created to demonstrate the transmission of IO signals.
4. Meeting this requirement will be decided by the Sponsor and Test Users.
5. Meeting this requirement will be self-evident.