Automated Locker

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Project Description

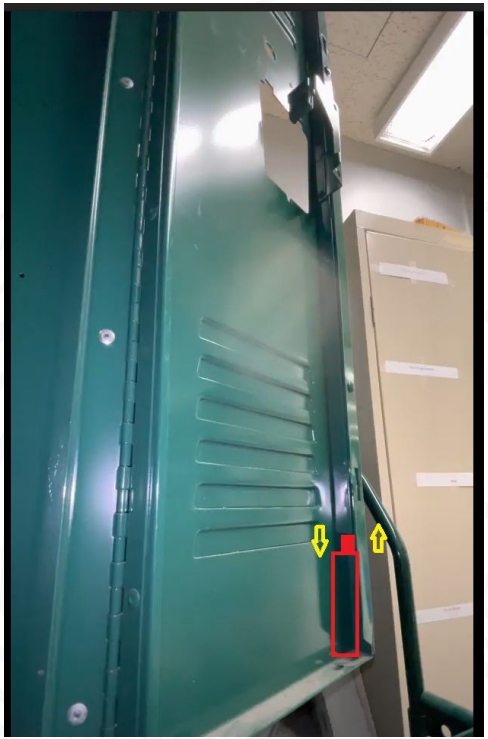
- Locker for a student with special needs
- Student cannot use a regular locker
- Client: Student at Alden High School
- Developing an automated locker using a RFID scanner to help open his locker with ease

Basic Interface

- Design will be consistent with previous semesters' automated locker
- Design will be adapted to use RFID scanner instead of keypad/display
- Client has trouble with fine motor movements so RFID is the best approach

How the locker door will unlock

- The student will scan an RFID tag activating a solenoid
- The solenoid will be placed at the bottom of the door
- When activated, the solenoid will push up a latch on the door unlocking it from the rest of the locker



RFID Scanner and Tags

- RFID Scanner is used for authentication
- Easy to use, only requires user to touch the sensor
- Multiple key “fobs” can be distributed to parents, teachers, janitors, etc.
- Client’s primary fob will be a wearable bracelet and secondary fob will be tethered to his laptop case
- Doesn’t require collection of biometric data or other legally sensitive information

Lock Housing

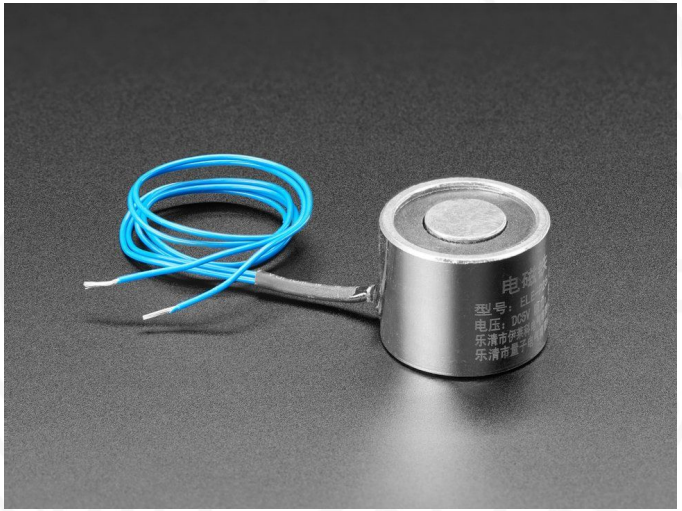
- 3D Printed lock housing
- Contains the scanner Mechanism that the client will use to open the locker
- Consistent with past locker designs

Manual Override

- In the event of power failure or broken electronic parts, the manual override will be used to unlock the locker instead.
- Will use a tumbler lock to achieve this
- Tumbler lock will be connected to the electronic unlocking mechanism during normal operation.
- Will be able to manually operate said mechanism when it is not possible automatically.
- A set of keys will be provided to the client and school staff.

Automatic Door

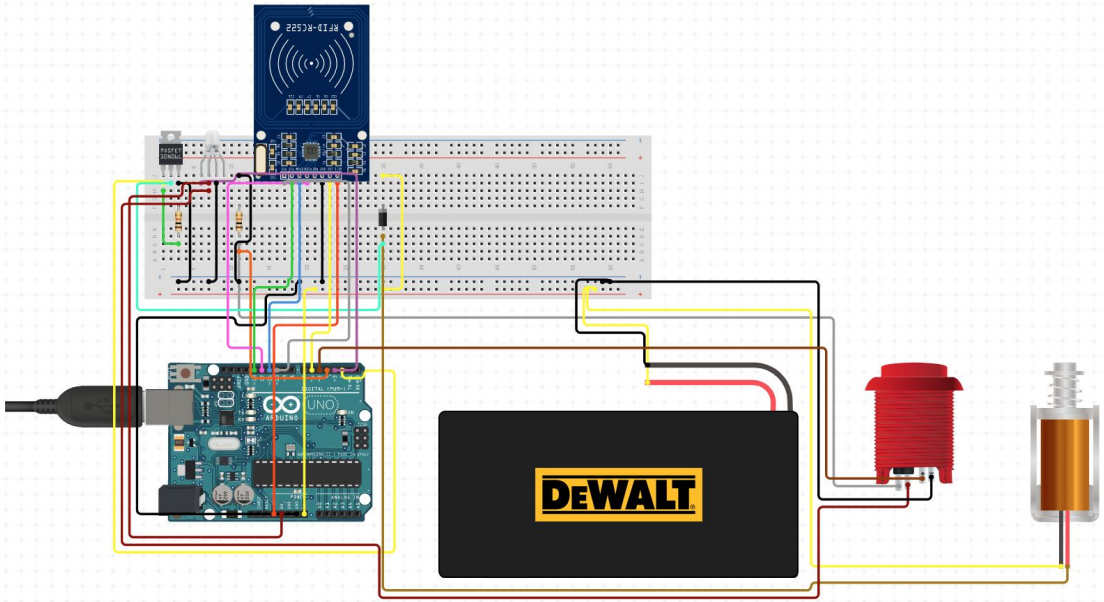
- Door will open slightly when it is unlocked so that our client doesn’t have to open it themselves
- Currently thinking of using electromagnets
- Opposing polarities will pulse on momentarily to provide enough force to open the locker



DC Power Supply

- Use Dewalt Power Tools battery packs for reliability, durability, and safety
- Use two charging stations and battery packs
- Convert one of the charging stations to be a housing dock for the battery in the system

Design



- Will be using Arduino IDE for programming hardware
- Will test RFID read/write implementation
- Configure buttons, motor, and status LED
- Configure DeWalt Battery to power our device
- Test implementation on Lockers in Lab

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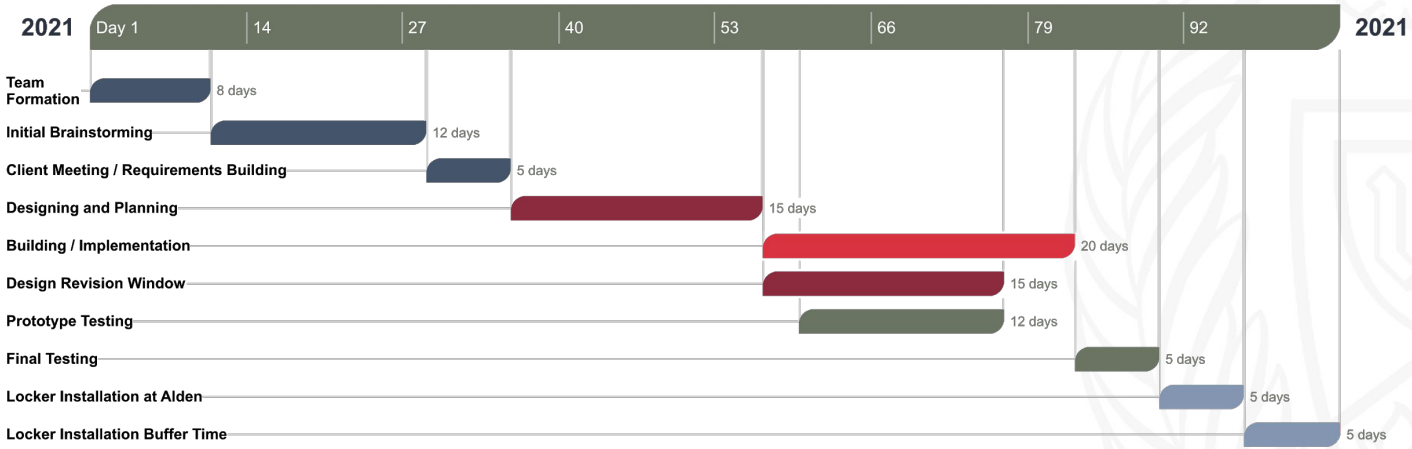

Questions/Feedback