

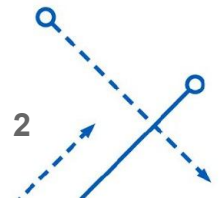


Automated Locker

Alden School District

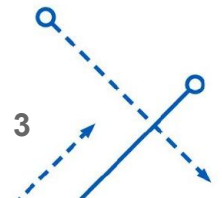
Team Members

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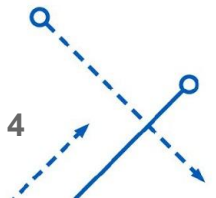
The Problem

- Some students at Alden high school have difficulty opening lockers with a regular combination lock.
- The locks are too small and complicated for some students to use.
- The school wants an easier way for these students to open their lockers while still using a passcode.



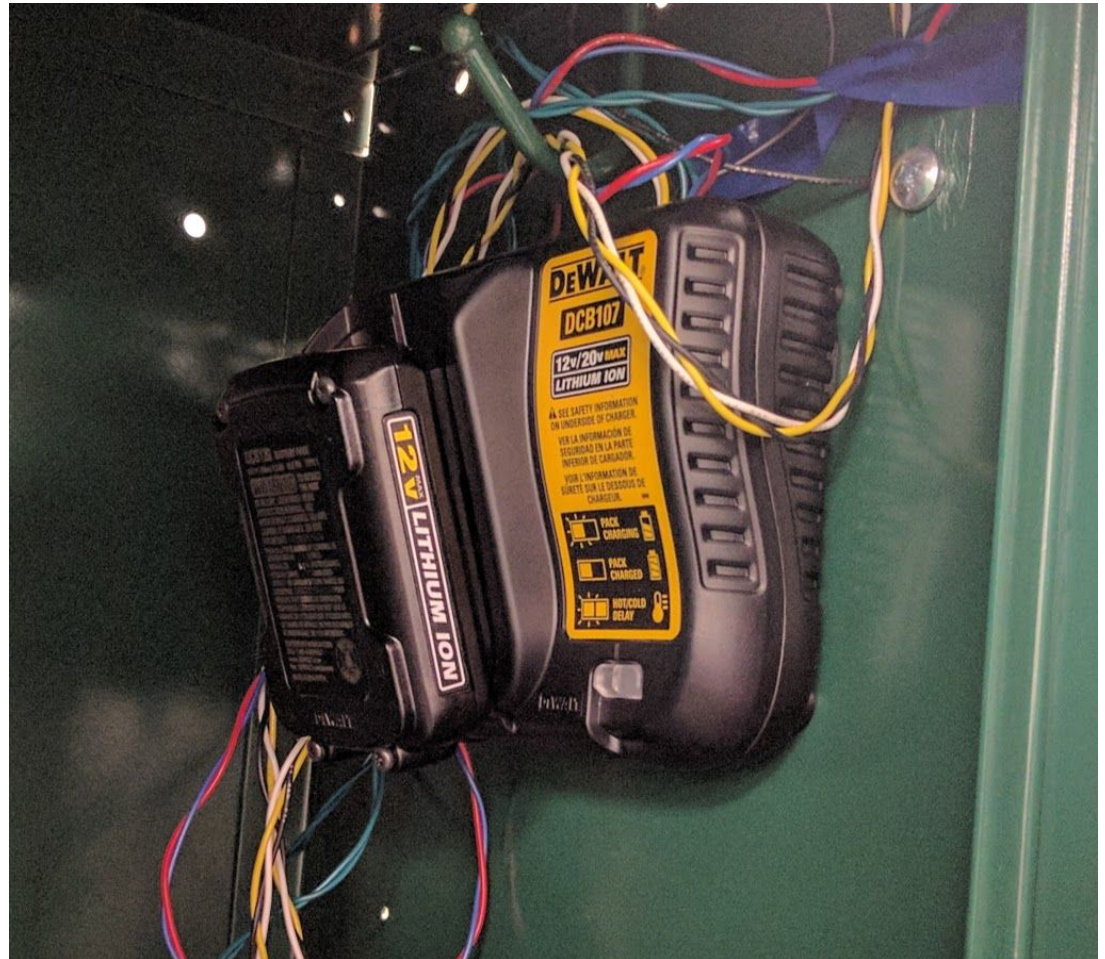
Approach

- Battery powered touch screen system to control solenoid lock
- Screen's embedded microprocessor will be used to check user input and signal solenoid
- Custom 3-D printed case to mount screen in locker recess



Circuit Housing

The Dewalt battery case has been gutted of all the circuitry. We mounted it at the top of the locker so it is out of the way and so it can avoid spills and water.



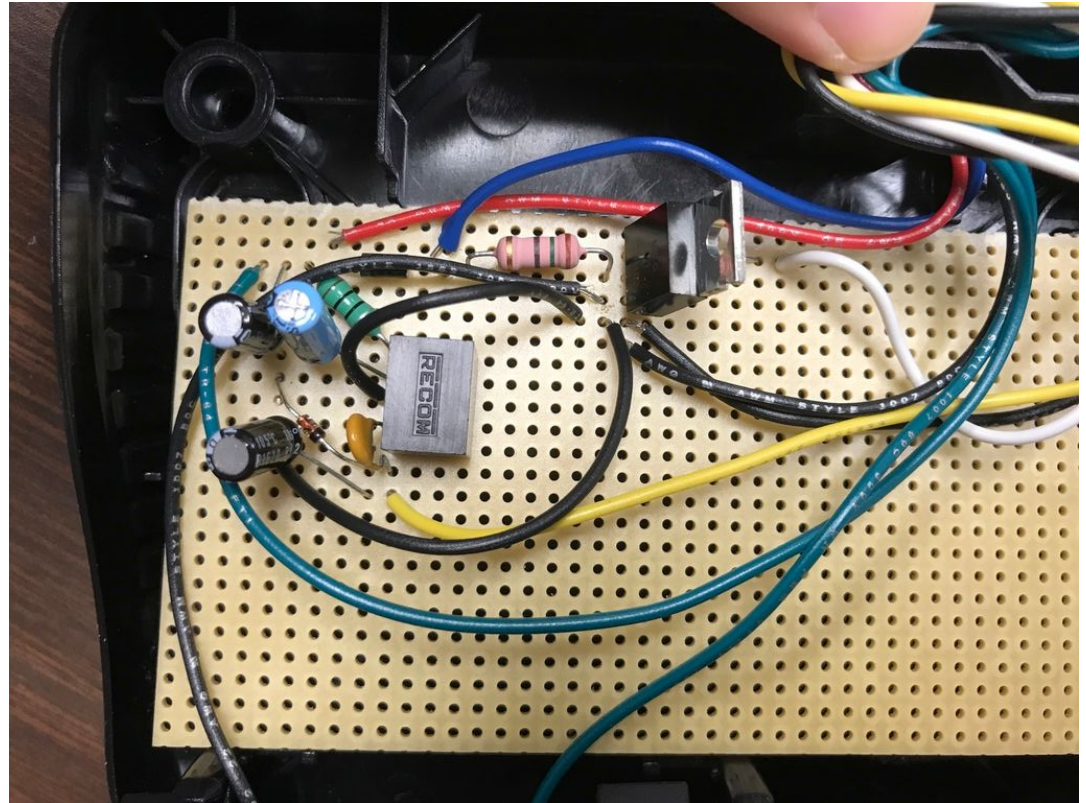
External Battery Charger

- The external battery charger will be kept in the classroom to charge the extra battery when it is not in use.

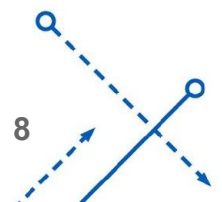
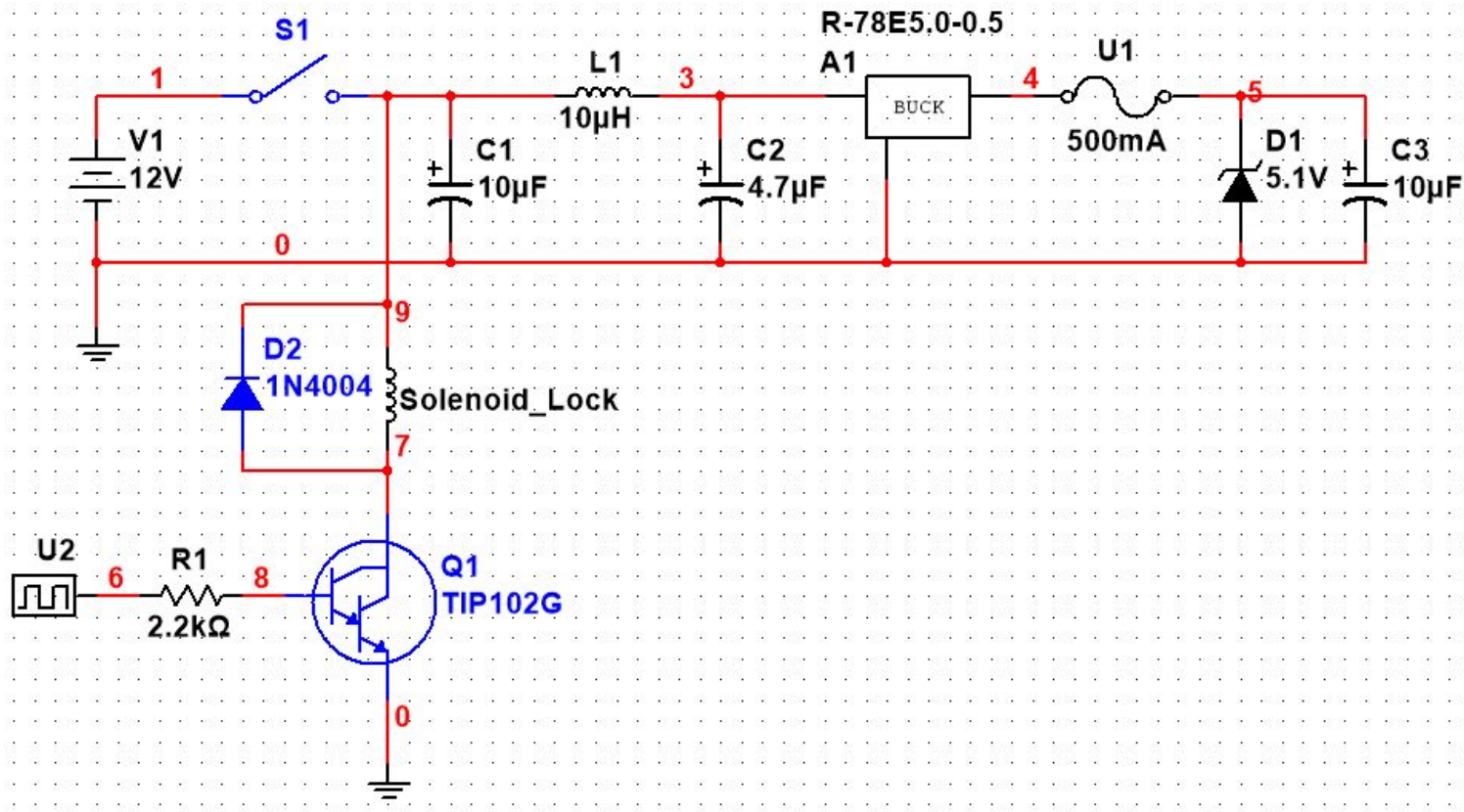


Inside Circuit Housing

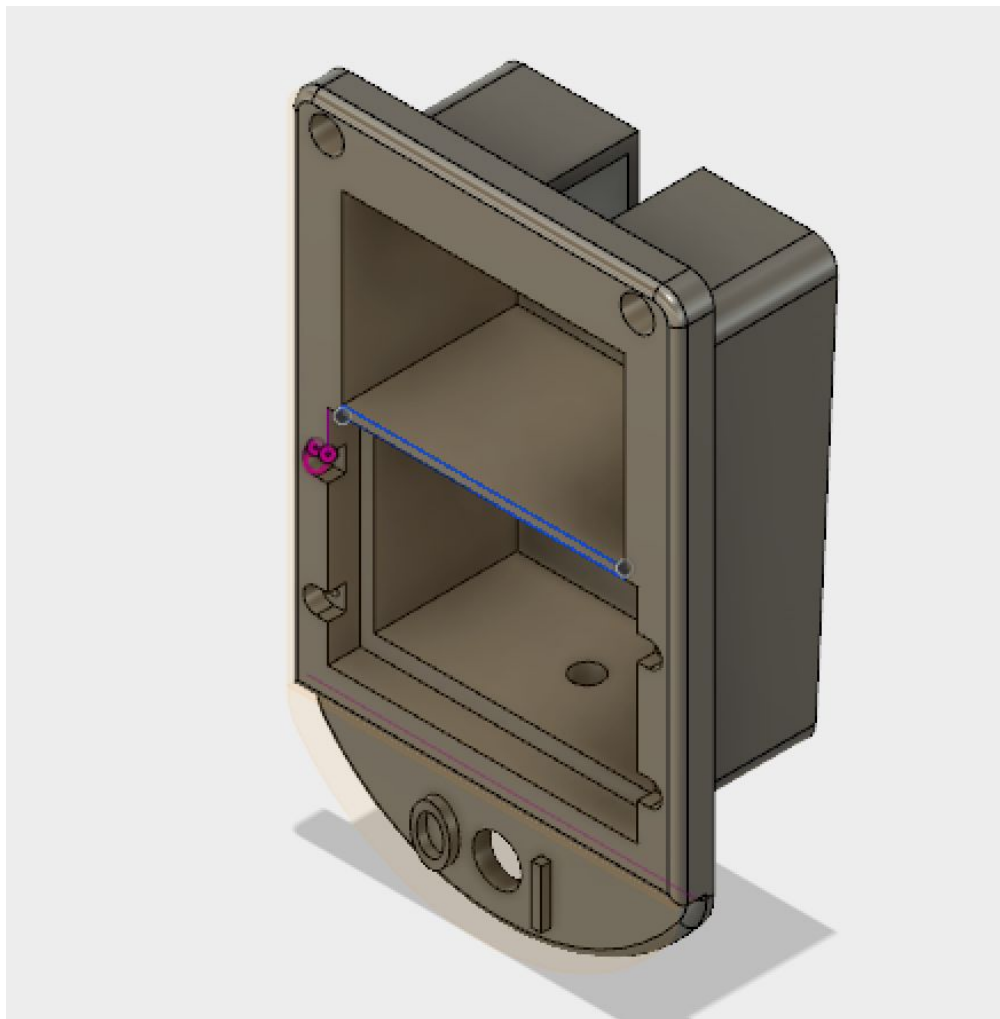
- The circuit was built on a perfboard which is mounted inside the Dewalt battery case.
- The battery connected on the top will supply the power to the circuit which will then drive the screen and solenoid.



Circuit Design



Screen Case

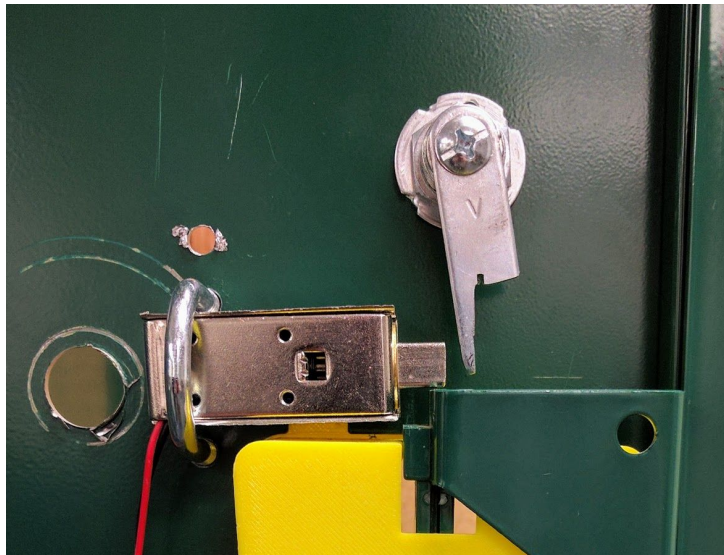


Screen Case



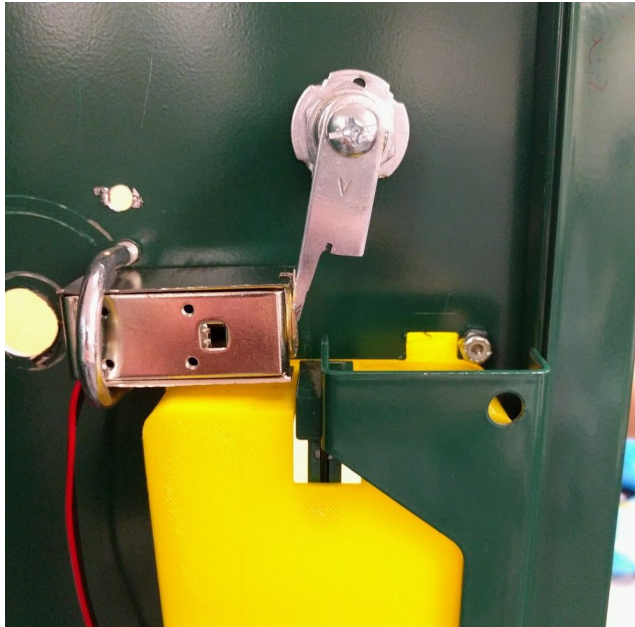
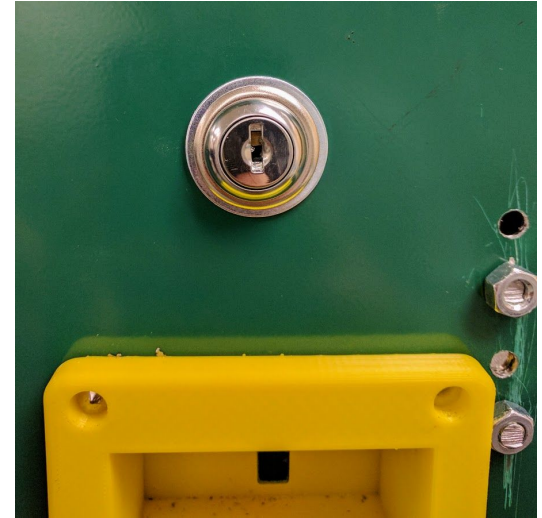
Solenoid

- The solenoid remains in the locked position while no power is being supplied to it.
- When the user enters the passcode the solenoid will open for 5 seconds allowing the user to lift the handle and open the locker.



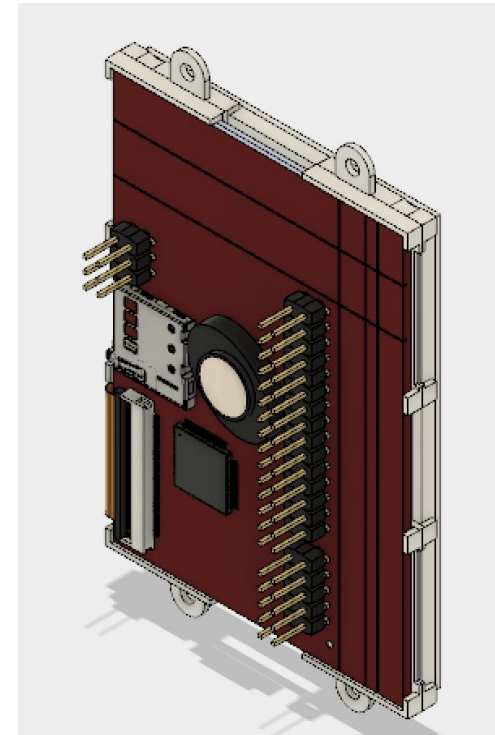
Manual Override

- The manual override is used with a key we provide.
- A plate will push the solenoid lock out of the way so the locker can be opened by faculty members or if the battery dies.



Screen

- Student User can open
- Admin User can reset password
- Powers off when not in use



Locker Demo using the screen



Locker Demo with manual override

