# Mag Spoof

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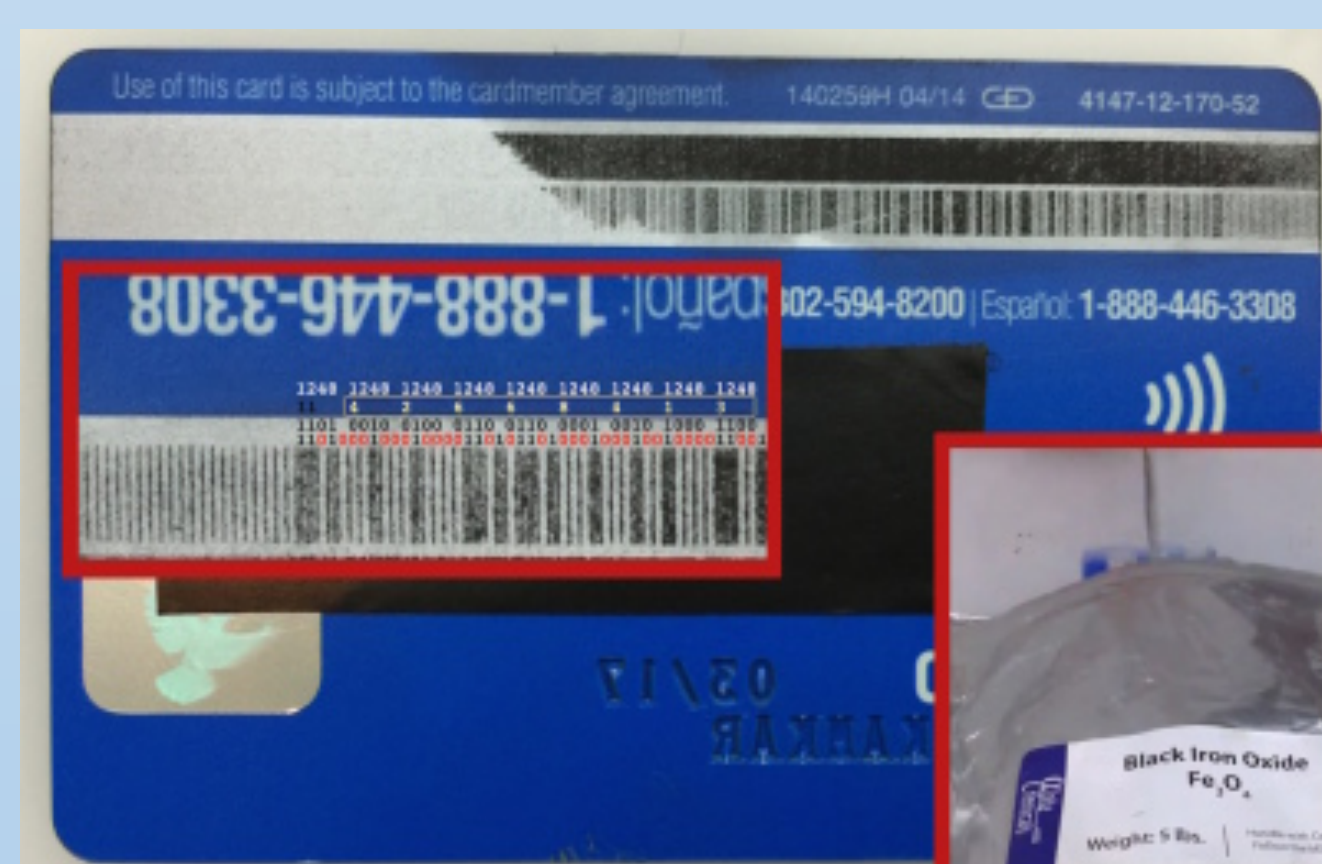TA: Amelia Delzell/James Feher

## Concept

Design a device to 'swipe' in wirelessly to buildings by emulating the characteristic magnetic field generated by an ID card

## Goals

1. Mimic an ID swipe to enter a building
2. Create software to use multiple cards on the device interchangeably
3. Create a PCB for our hardware
4. Design an enclosure for our device

## Background

- ID Cards carry a unique identifying number in the top left hand corner.
- The number is encoded into magnetic strip using ferrous bits
- encoded ID generates a characteristic magnetic that can be read.



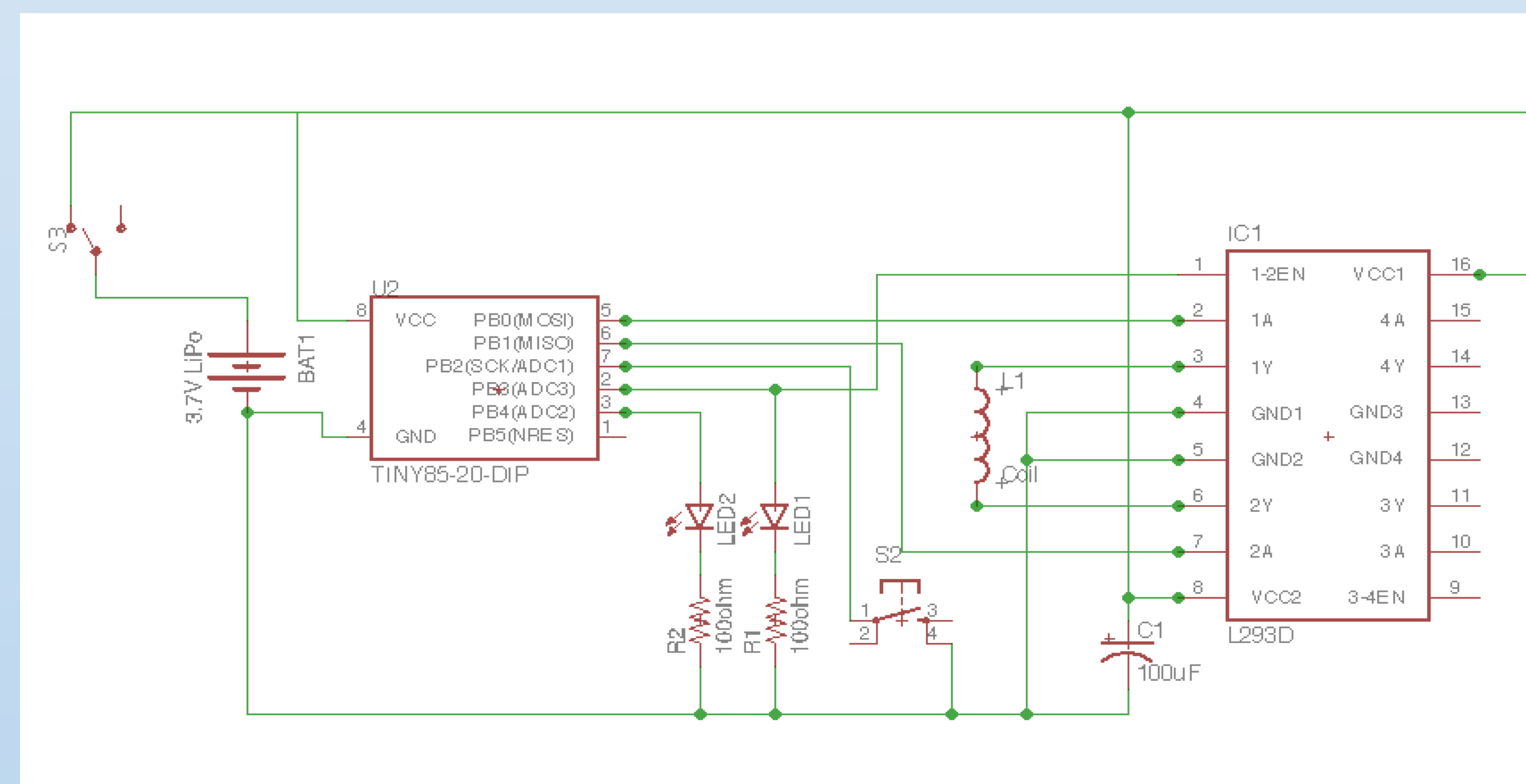-Iron filings will stick to the magnetized stripes on a card
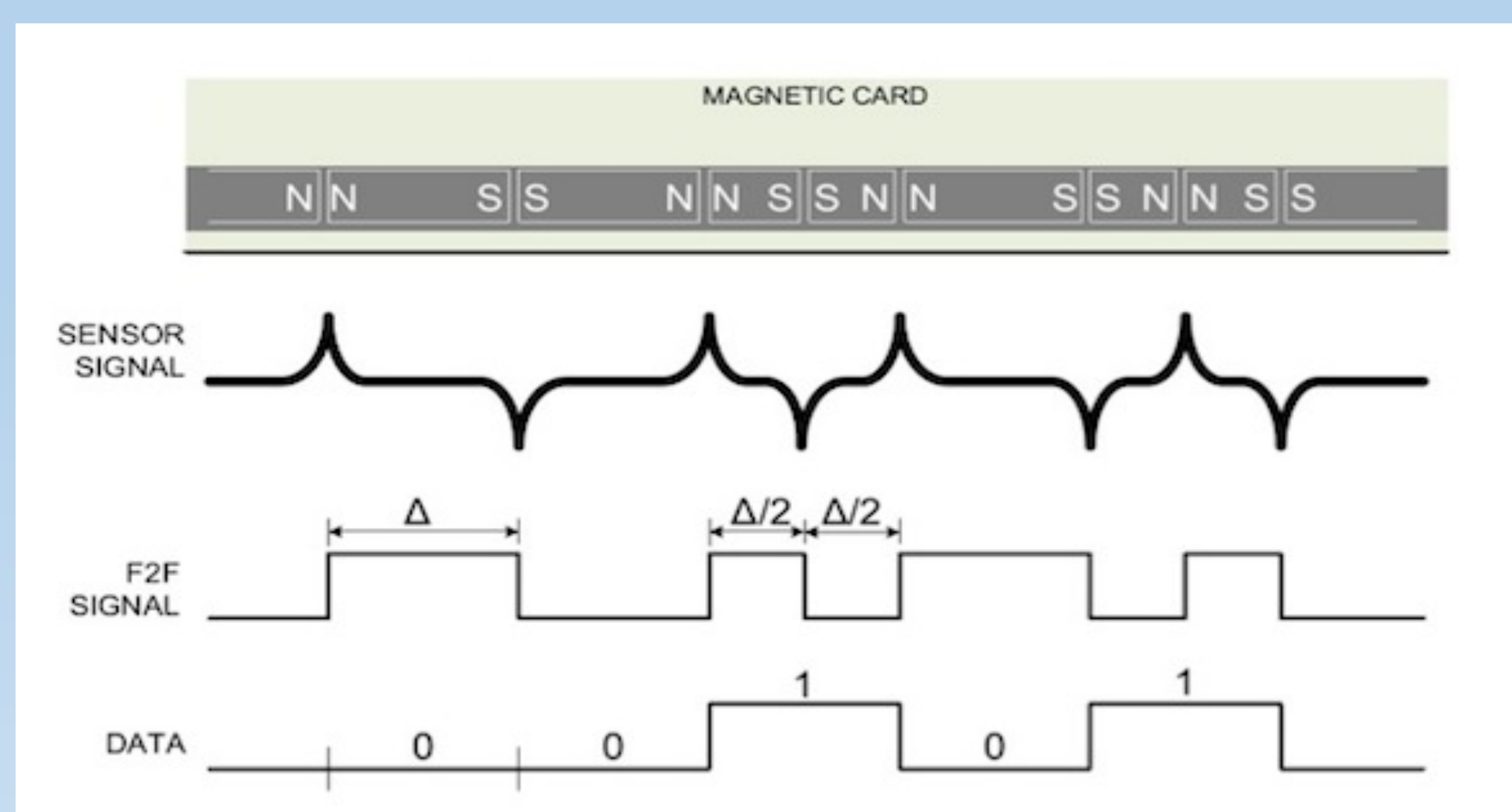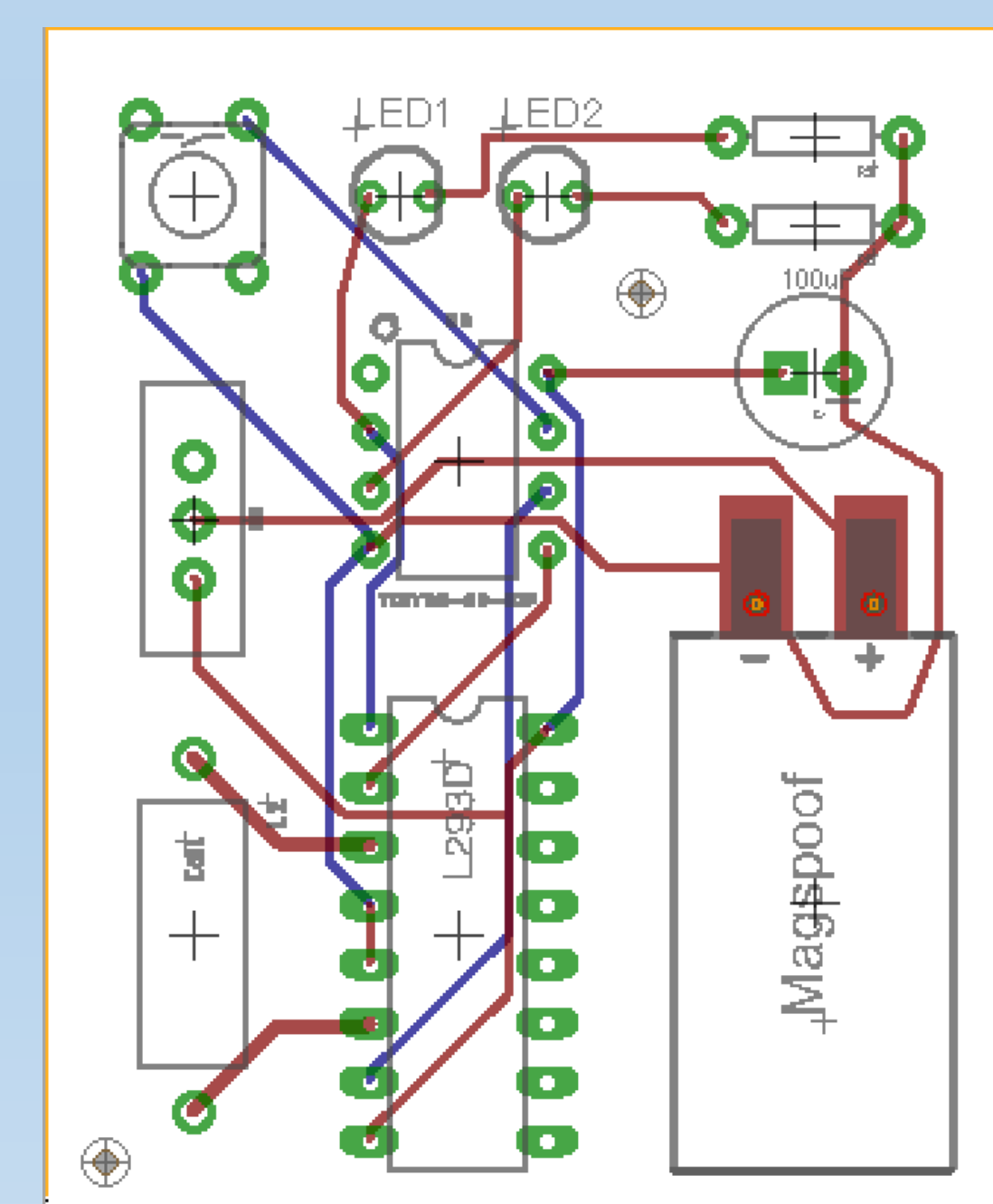


–Sensor signal from read head
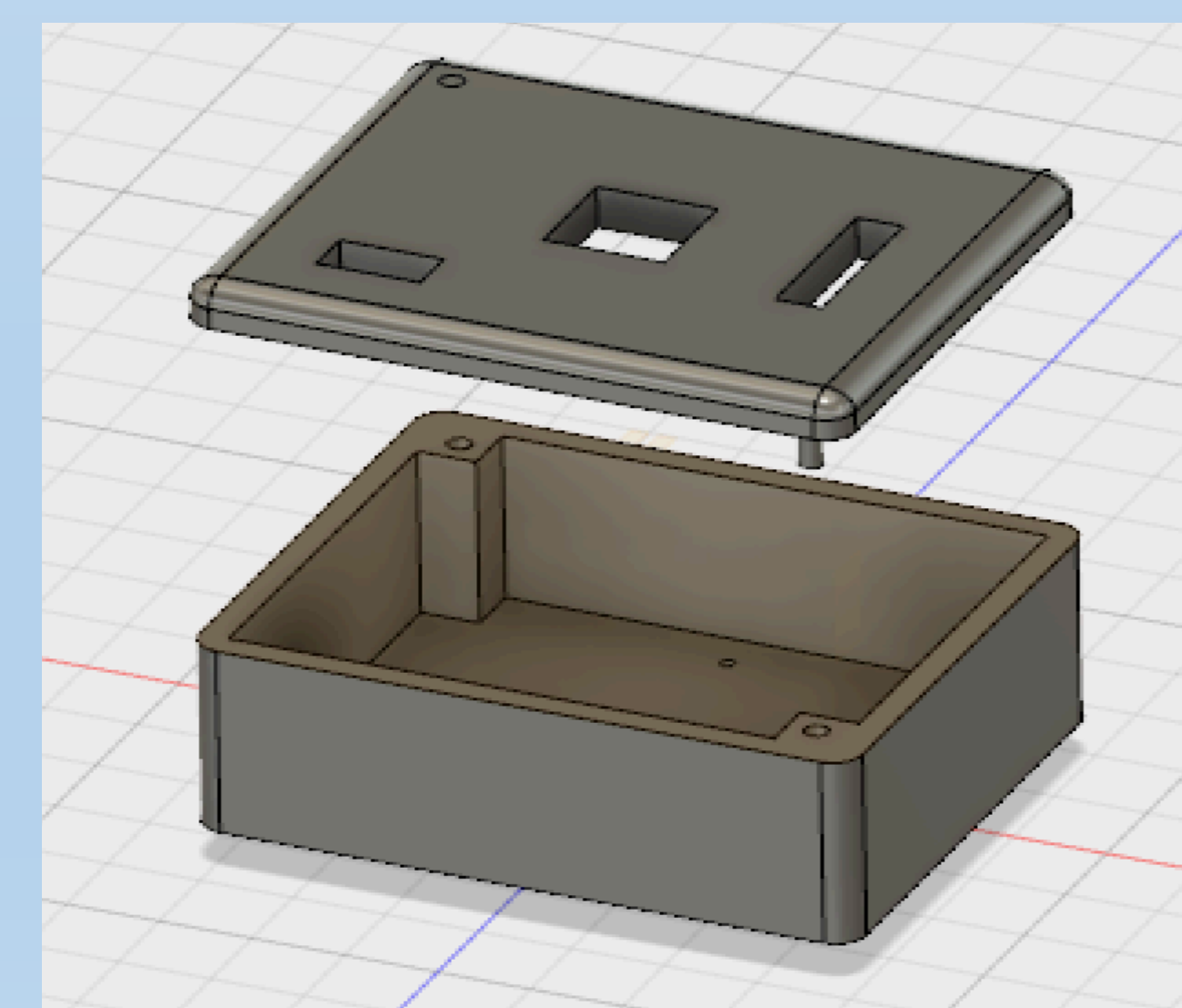
## Circuit & Enclosure Design

- Device is controlled by Atmel Attiny85 microcontroller
- H–Bridge passes current through an inductor to imitate magnetic field of ID card
- Schematic, PCBs rendered using EAGLE and PCBs order from OSH Park Sales
- Enclosure is 3D printed



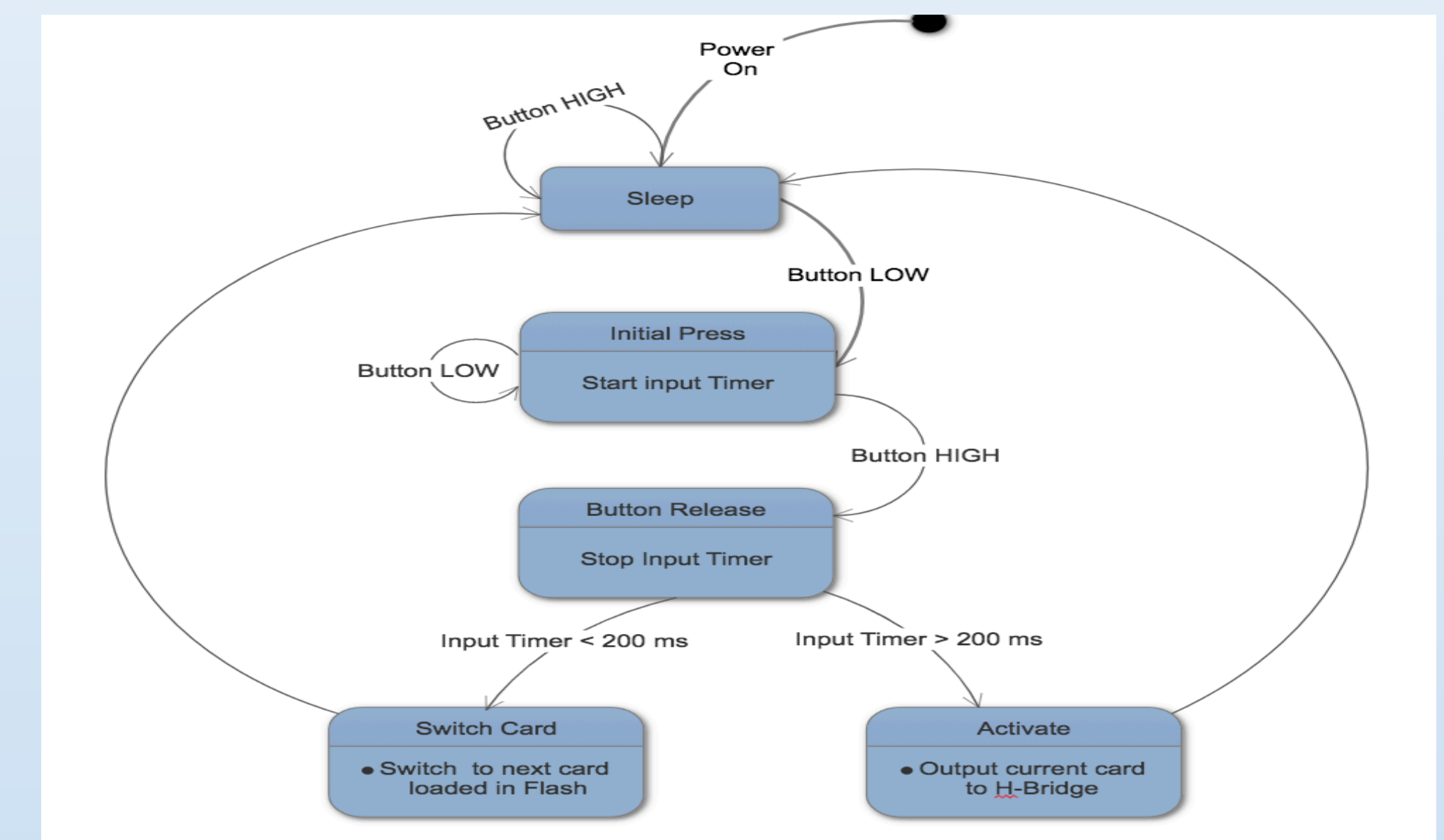-Circuit schematic designed with Sparkfun catalog library



–PCB routing layout using EAGLE



-Device enclosure designed in Fusion360

## Multi–Card Software

- Controller was programmed using an AVR programmer, Arduino IDE, and Attiny library created by David A. Mellis
- Software based on work by Sammy Kamkar



-software state machine

## Cost

- $72.20 with AVR programmer and PCB to reproduce device
- $114.18 total cost for product development

## Ethical Concerns

- Card Info. in the top left of ID can be programmed into Attiny85
- Possible identity theft
- Capable of spending BearBucks and unauthorized access to buildings
- Highlights weakness in magnetic stripe technology and need for replacement