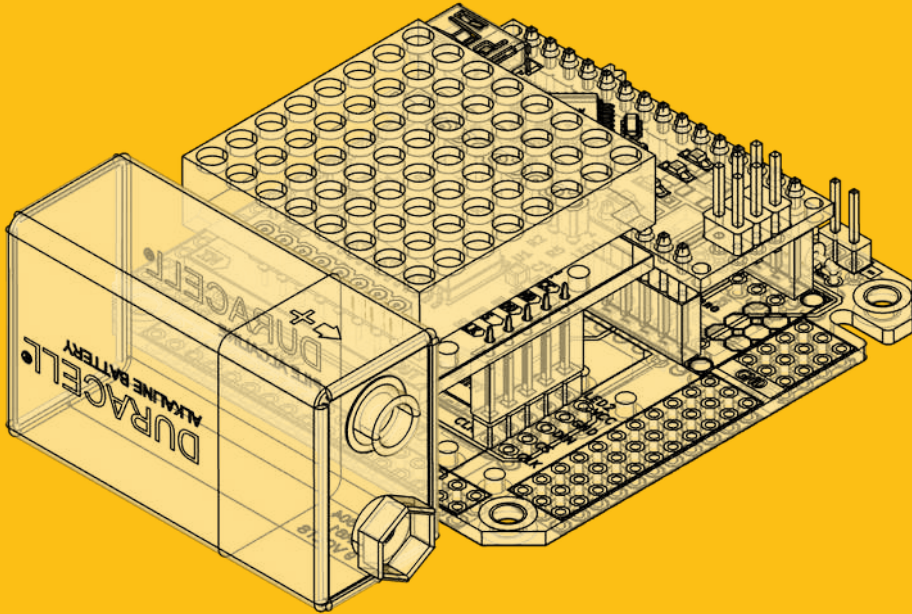




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# **"Bag Tag" v3**

## **Electronics**

### **8x8 LED Matrix**

**(Proposed project  
for Innov School Jr)**

# Requirements

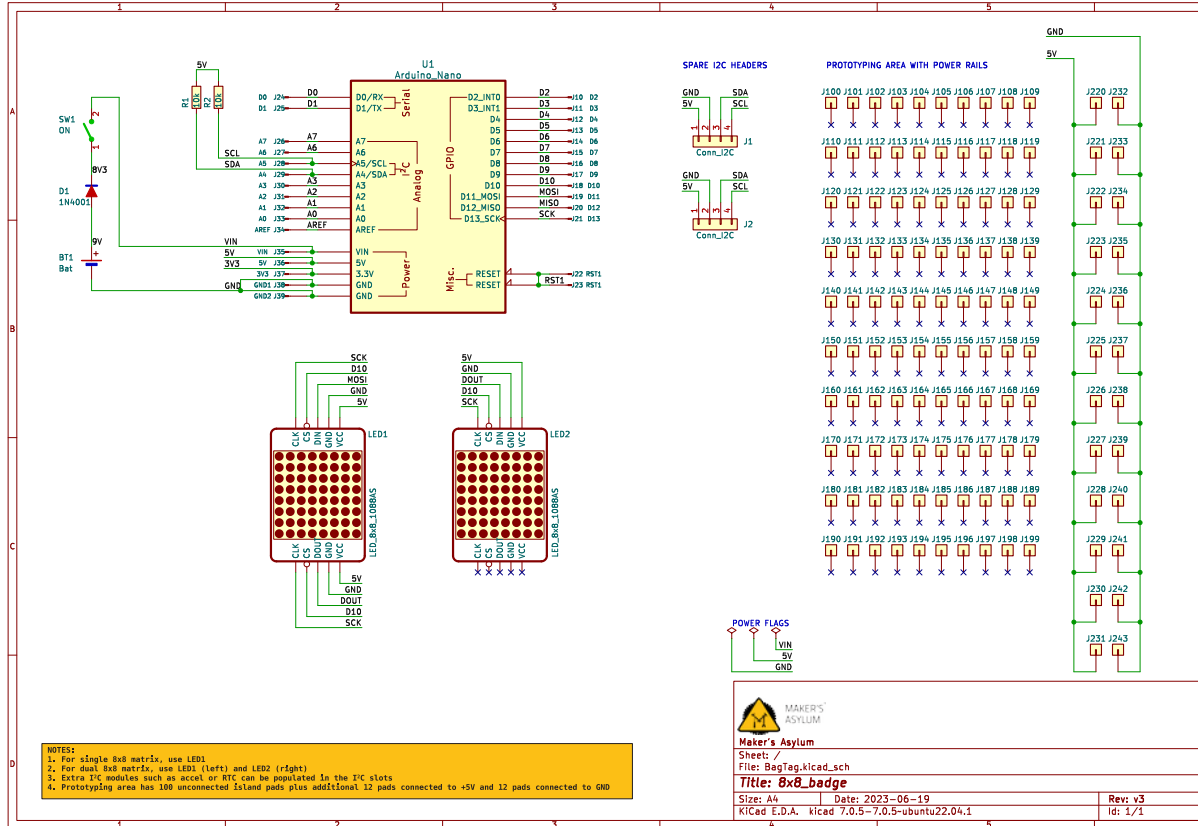


- Complexity level - SIMPLE
- Must include elements of
  - Electronics (soldering)
  - Arduino (programming)
  - Rapid prototyping (3DP/laser)
- BADGE form factor
- Powered by 9V battery
- Expandable / Hackable

## Changes in v3 (v/s v1 & v2)

- All parts on FRONT, but battery on side
- Two I<sup>2</sup>C expansion headers
- Can install one or two 8x8 SINGLE color LED display based on MAX7219 chip
- Parts aligned along vertical axis for balance
- 100 prototyping pads and 12 each for +5V and GND

# Schematic



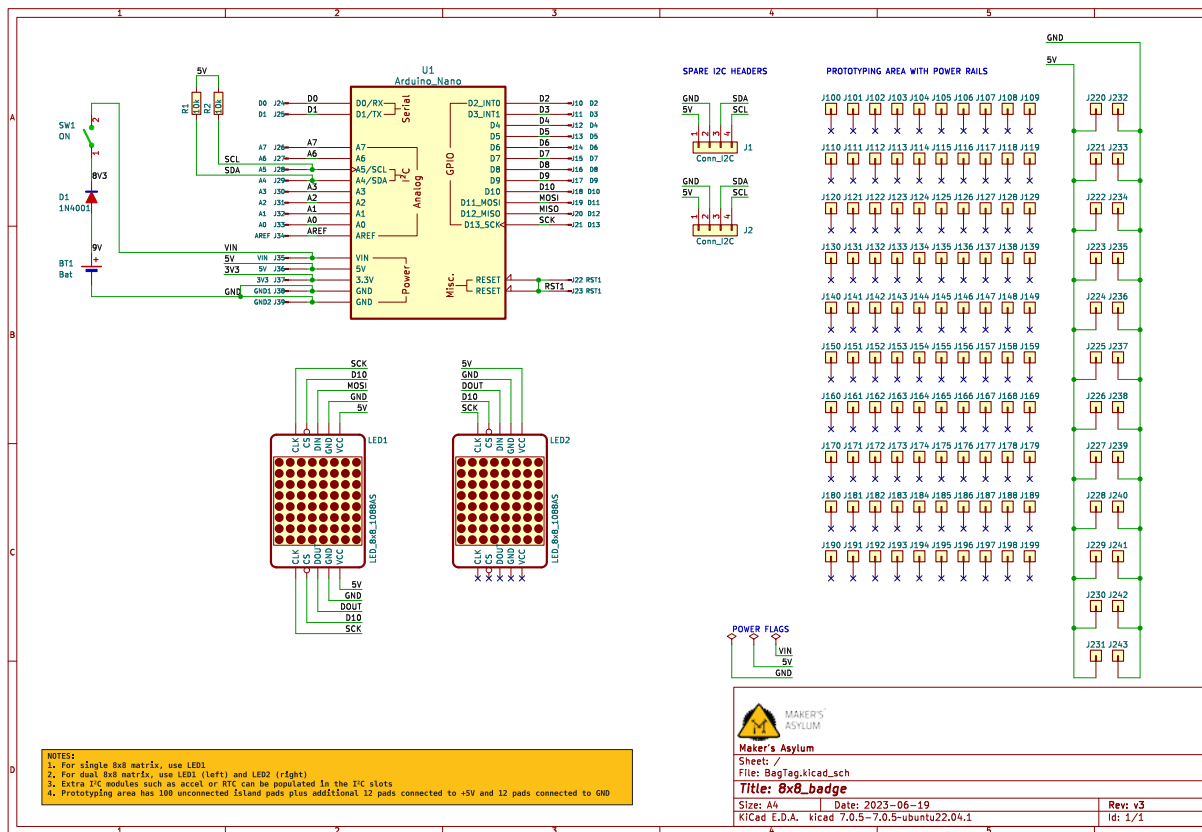
## Components:

- Arduino Nano
- Single Color 8x8 LED Matrix based on MAX7219
- Switch
- Diode
- 9V Battery with clip
- Header sockets
- Header pins
- PCB

# Options



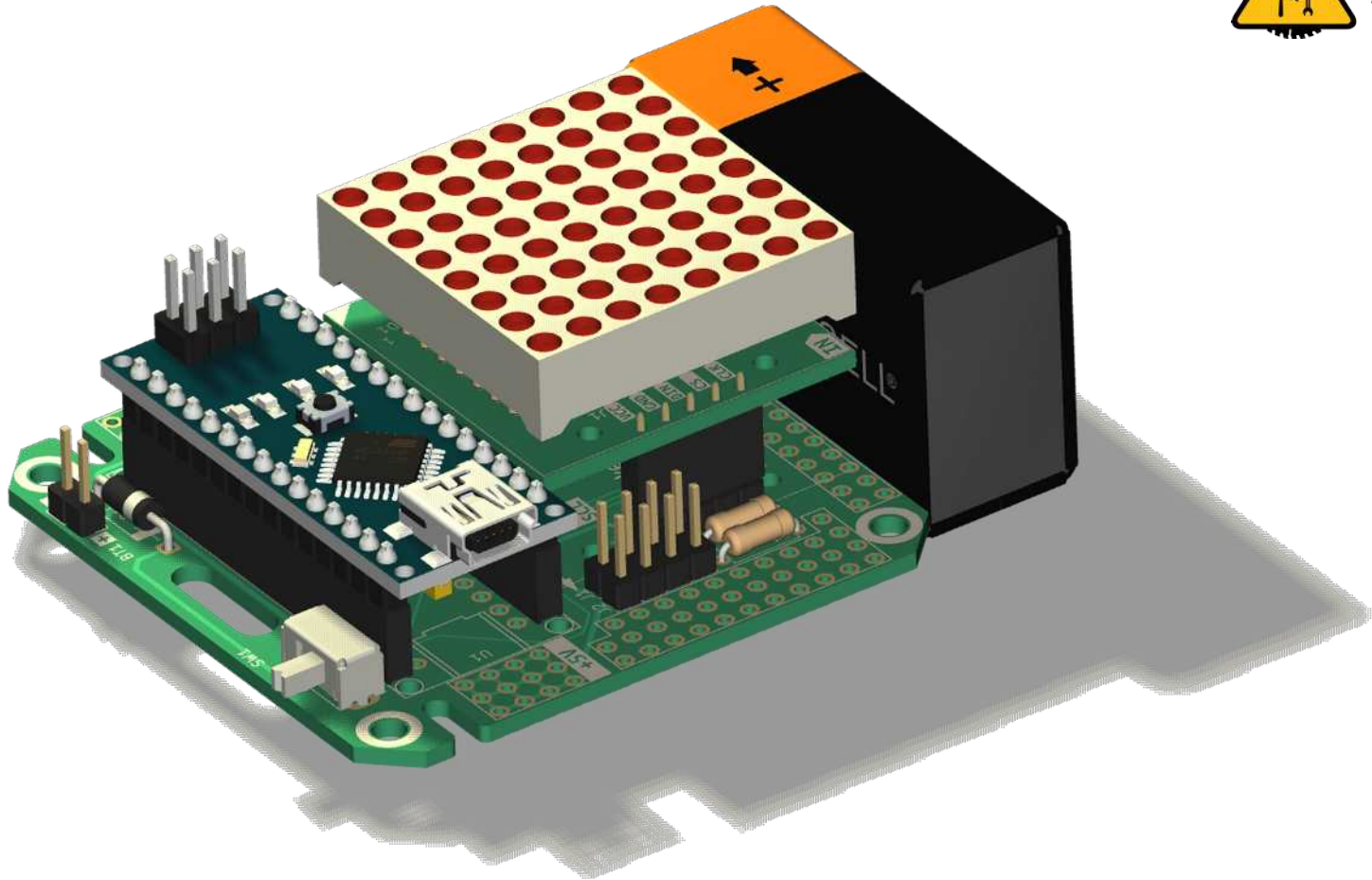
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Optional upgrades  
(not included in kit)

- 2<sup>nd</sup> single color 8x8 LED Matrix
- Add extra modules
  - I<sup>2</sup>C modules such as accelerometer, IMU, RTC
  - Buttons, joystick etc
- Hackable via prototyping area with 100 pads+ 24 power rail pads

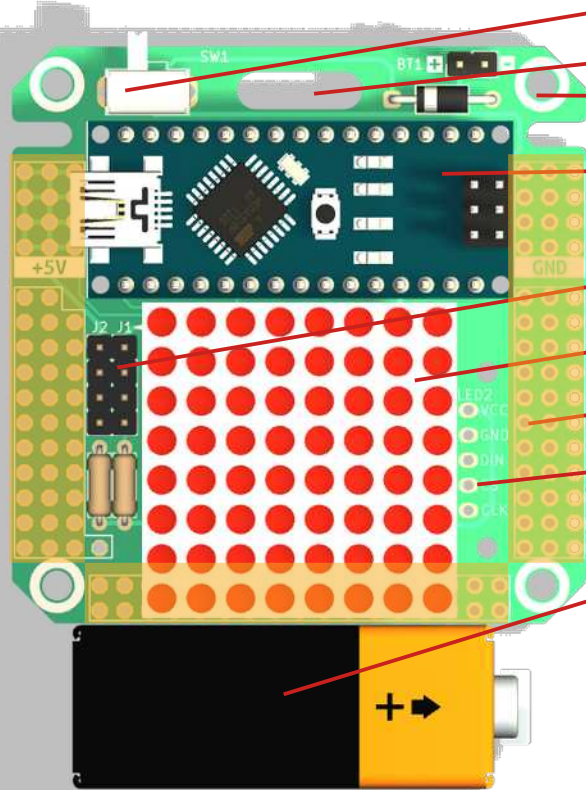
# PCB Render



# PCB Front view



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Switch

Lanyard slot

Mount holes, x4

Arduino Nano

Spare I<sup>2</sup>C, x2

Display

Proto area

2<sup>nd</sup> Display

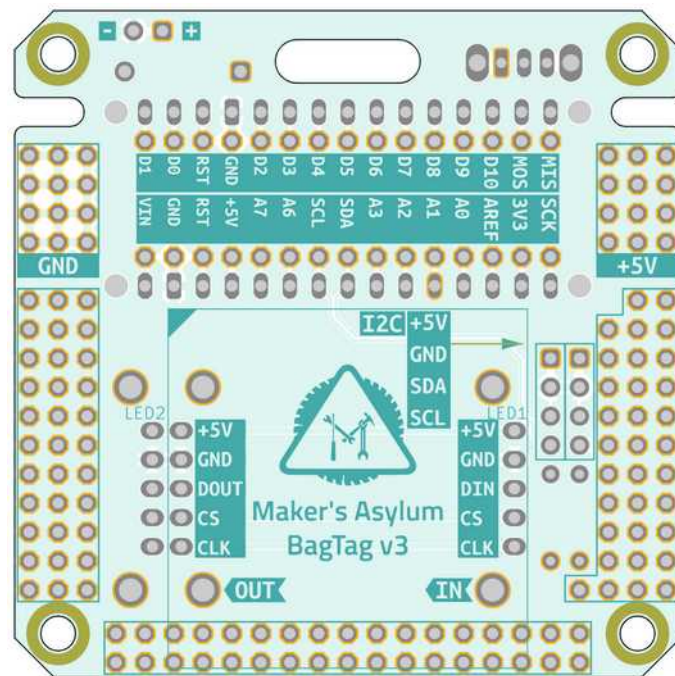
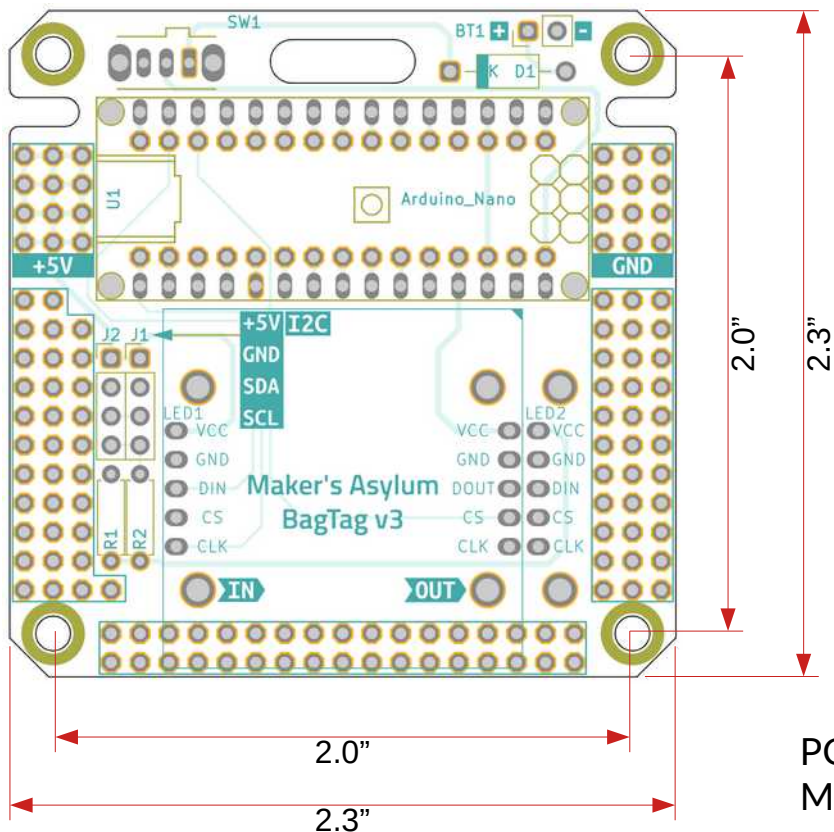
Battery, 9V



# PCB dimensions

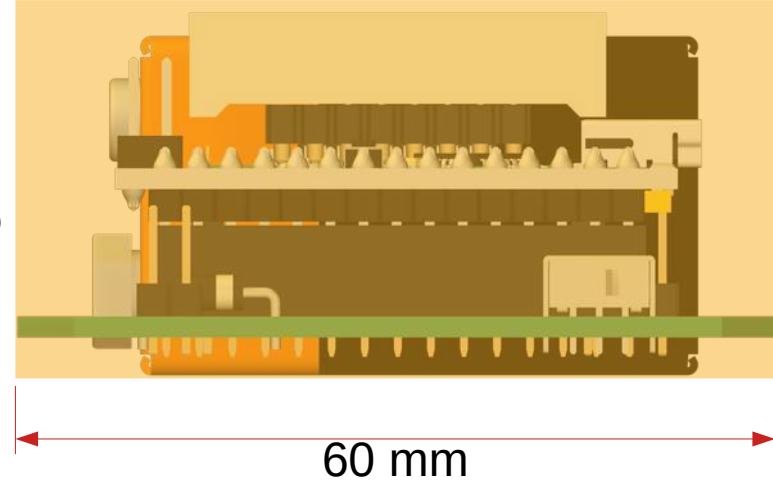
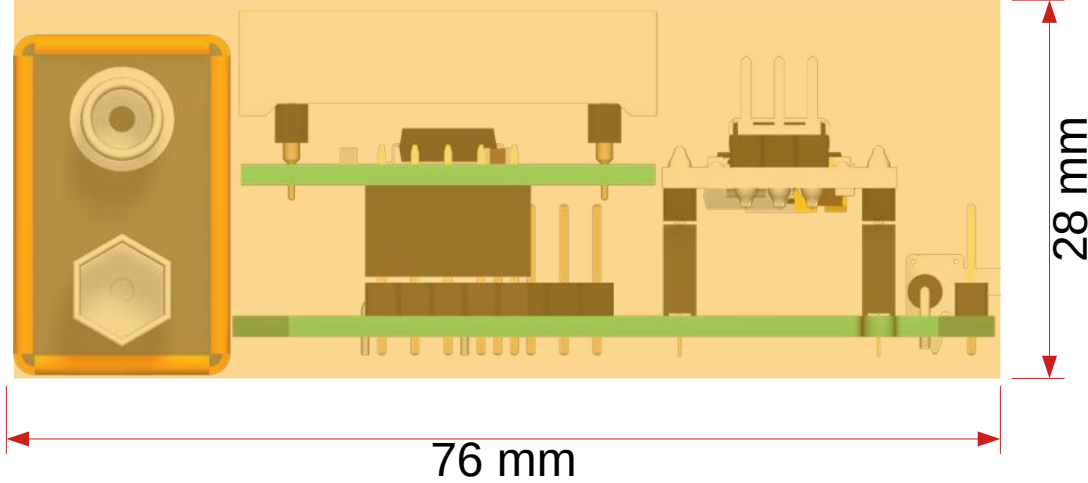


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PCB = 2.30" x 2.30" (58.4 mm x 58.4 mm)  
Mounting = 2.00" x 2.00" (50.8 mm x 50.8 mm)

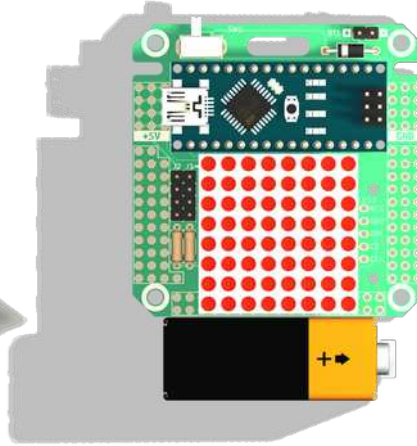
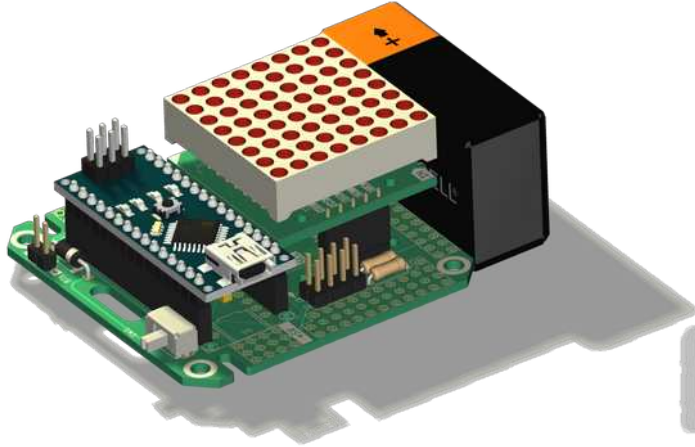
# PCB Side views



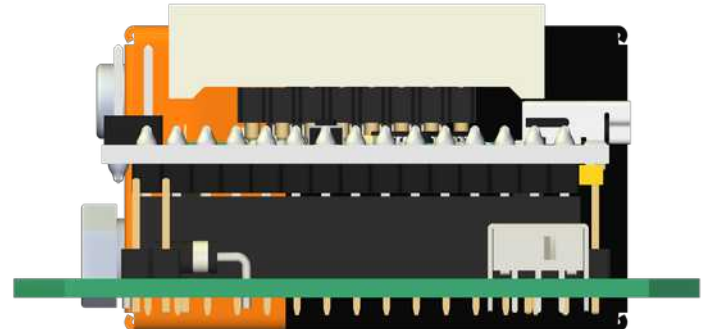
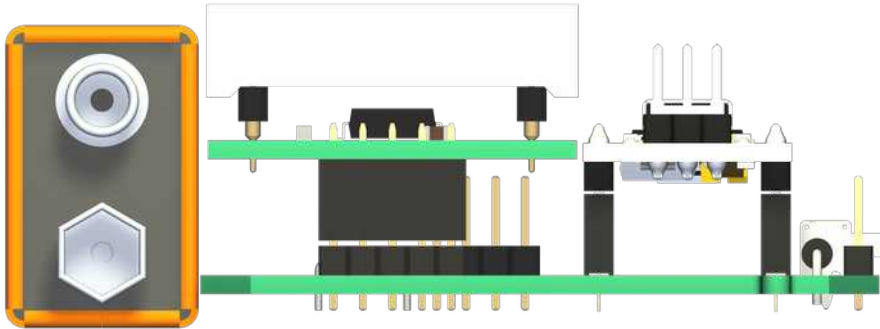
- Side views of the PCB.
- 8x8 LED matrix display and Arduino Nano require header pins and sockets.
- BagTag will fit inside a volume of 76 mm x 60 mm x 28 mm



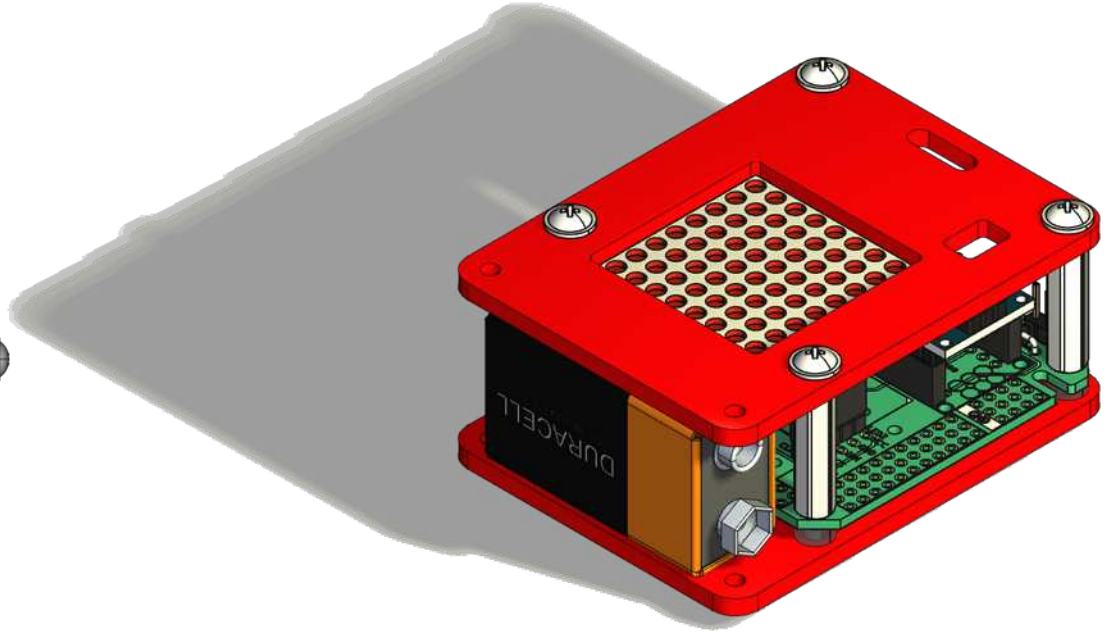
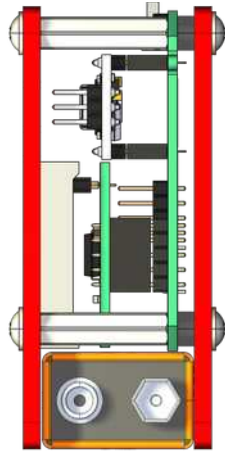
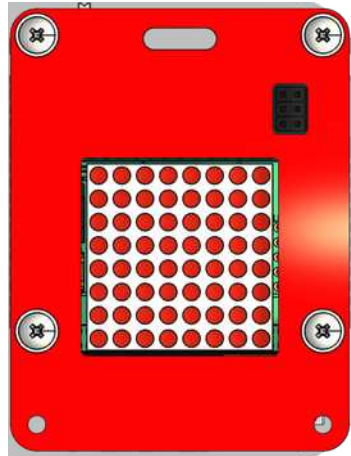
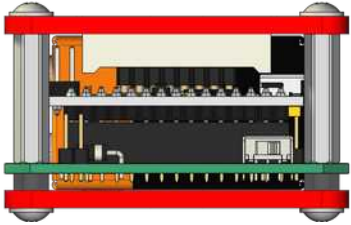
# PCB Battery location



- Battery is not located on the PCB.
- Battery mounting / orientation / location depends on enclosure

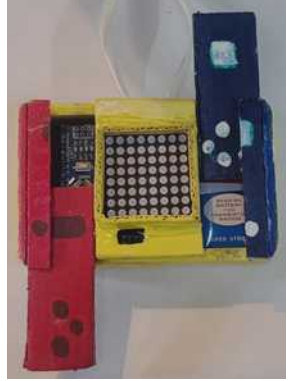
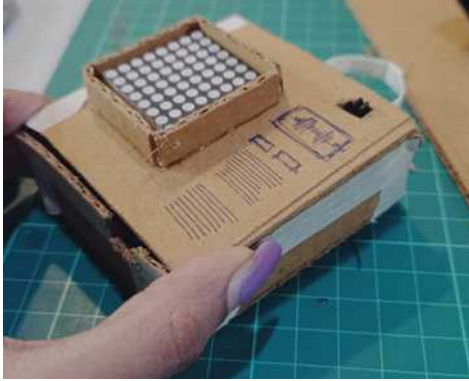


# Enclosure suggestion



See exploded view at  
[~/fabricate/renders/BagTag\\_v3\\_exploded\\_view.mp4](#)

# Enclosure suggestions 2



# Hacking



- Two extra I<sup>2</sup>C headers and 100 copper pads for future hacking
- Add a second 8x8 LED matrix, I<sup>2</sup>C modules (accel, IMU, RTC), buttons etc.
- Some hacking ideas:
  - Electronic Dice (using accelerometer for shake detection)
  - Timer or Clock (using RTC)
  - SNAKE game (using 5 buttons)
  - PONG game using two joysticks
  - Ornament or Wearable
  - VU meter (sound decibel display, using microphone module)