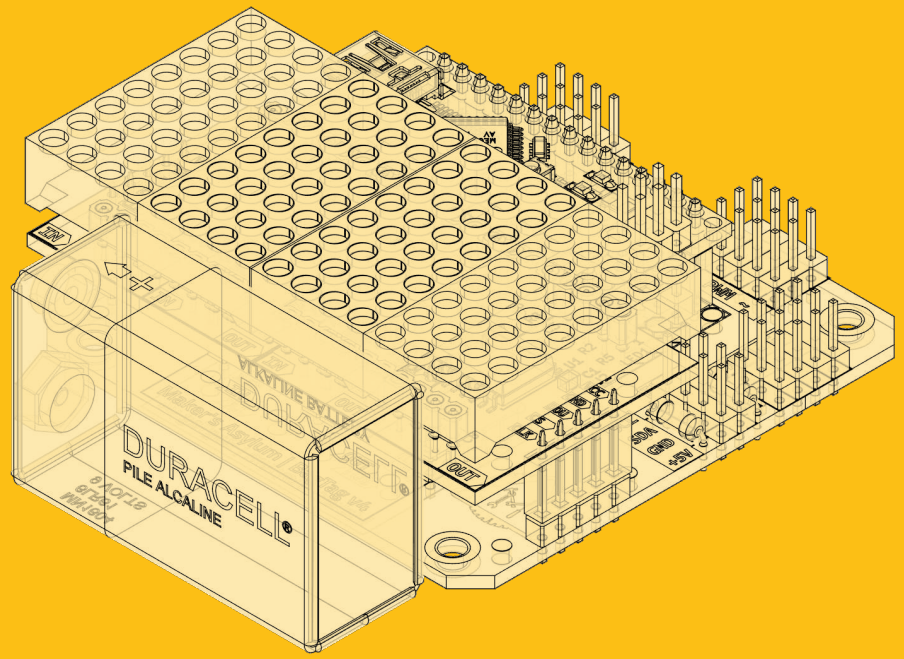
MAKER'S™
ASYLUM



“Bag Tag” v4 Electronics 8x8 LED Matrix

(Proposed project for Innov School Jr)

Requirements

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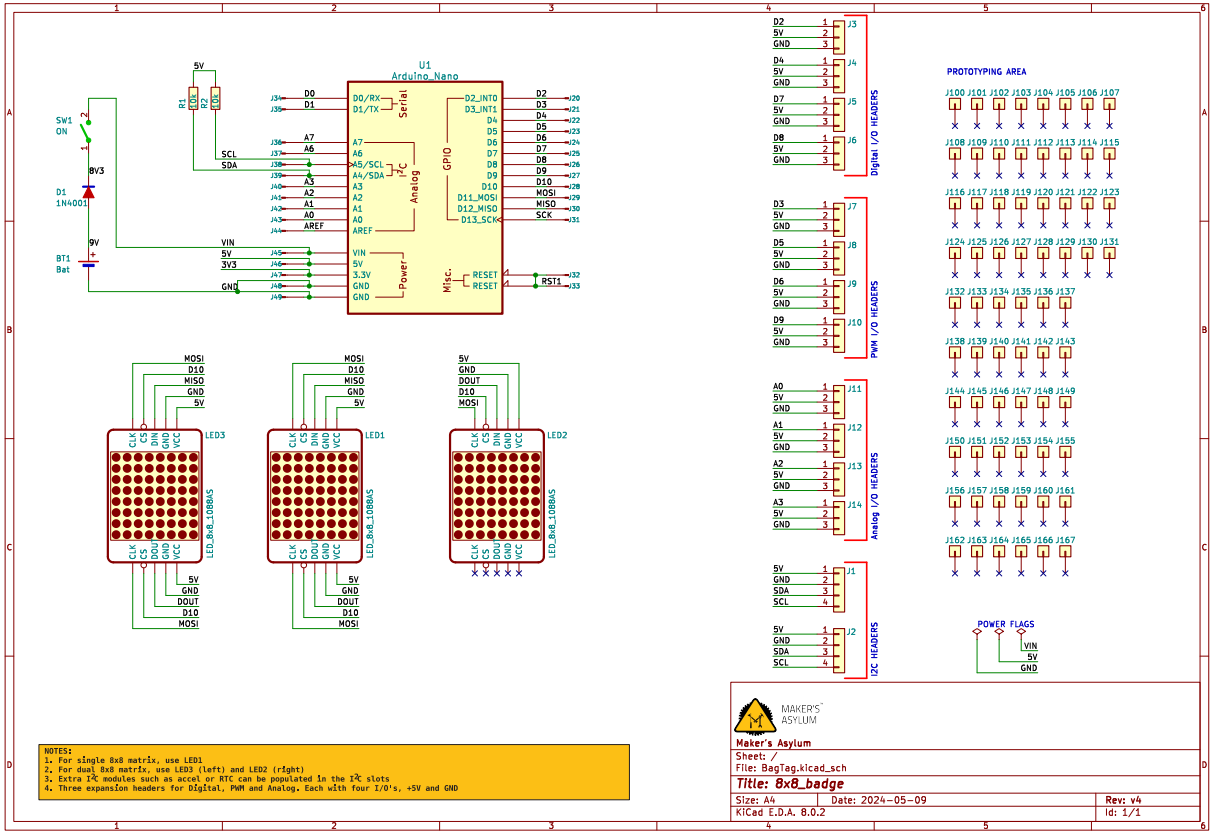
- Complexity level - SIMPLE
- Must include elements of
  - Electronics (soldering)
  - Arduino (programming)
  - Rapid prototyping (3DP/laser)
- BADGE form factor
- Powered by 9V battery
- Expandable / Hackable

Changes in v4 (v/s v1, v2 & v3)

- All parts on FRONT, but battery on side
- Two I^2C expansion headers
- Can install one or two 8x8 SINGLE color LED display based on MAX7219 chip
- Parts aligned along vertical axis for balance
- 3 expansion headers, each with 4 of Digital, PWM & Analog I/'s with +5V and GND
- Larger PCB size

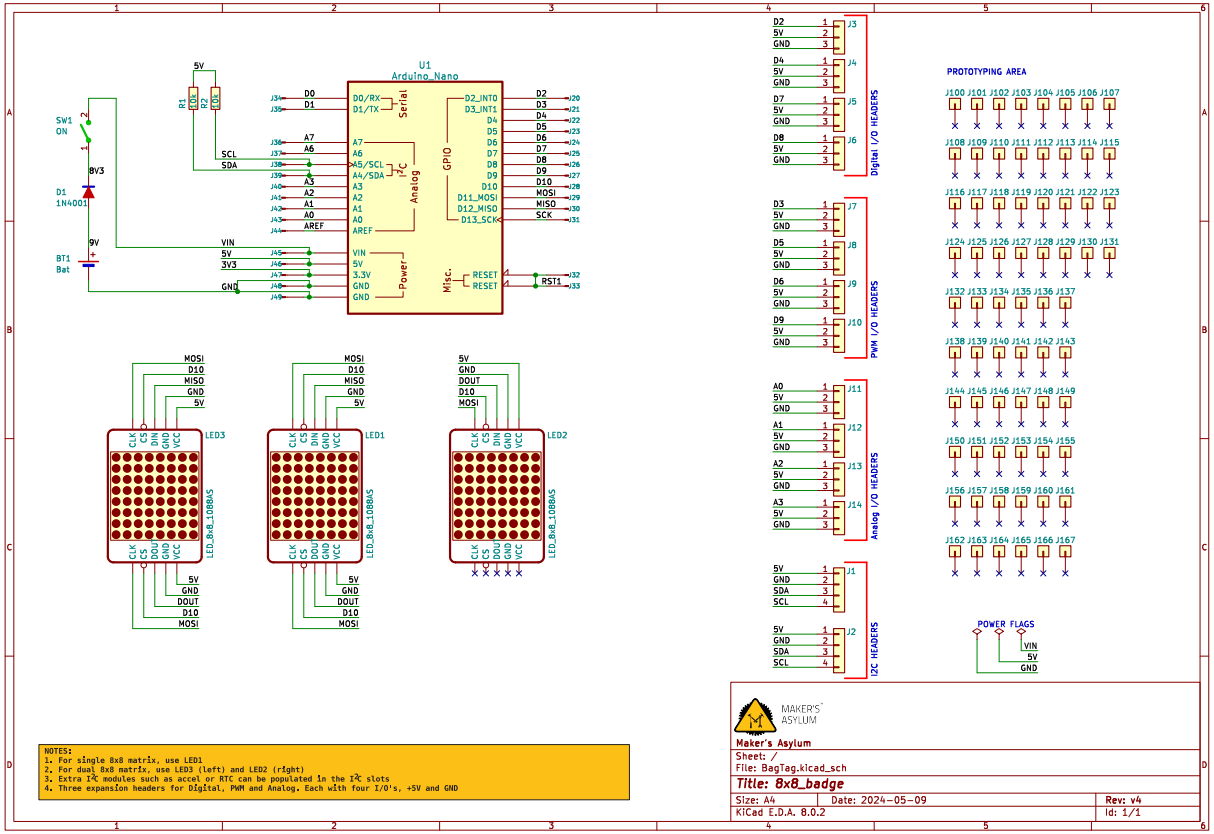
Schematic



Components:

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

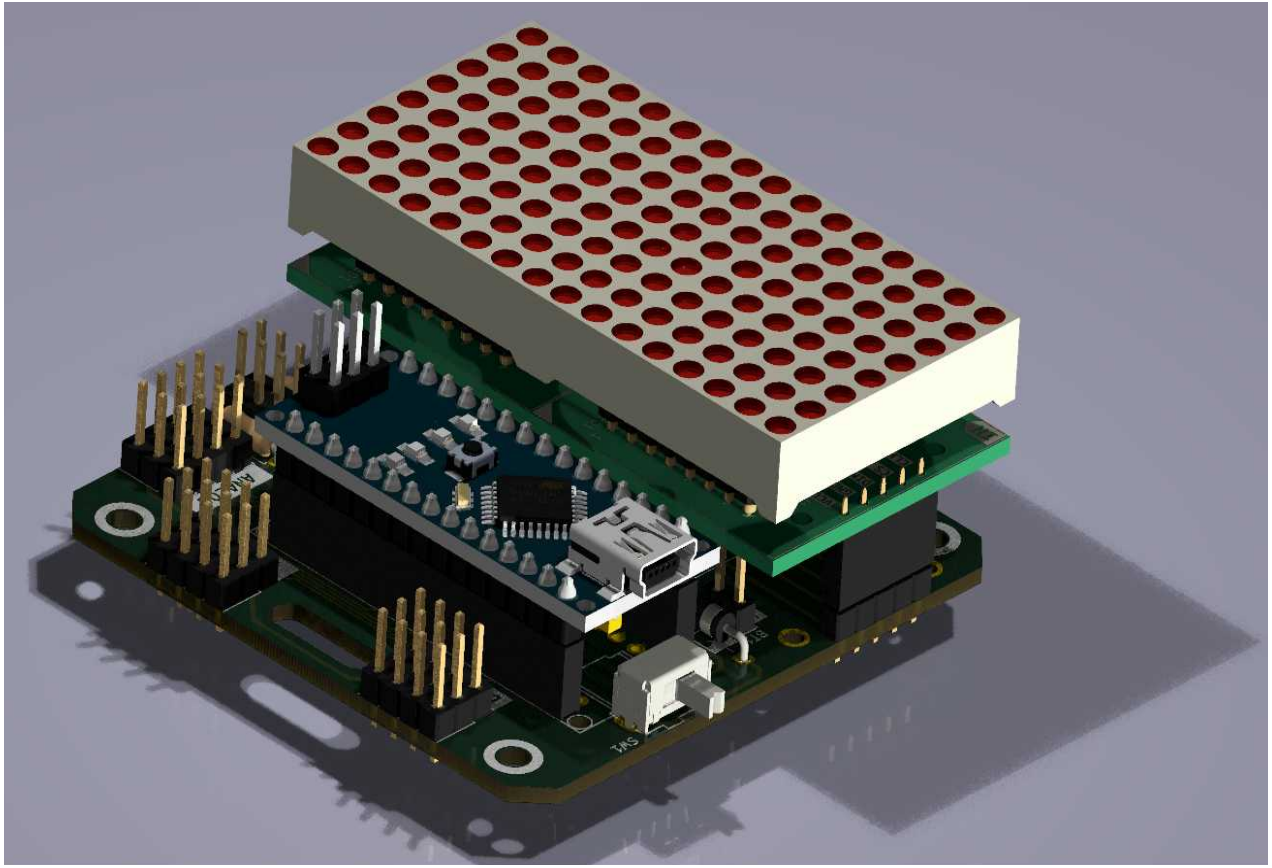
Options



Optional upgrades
(not included in kit)

- 2nd single color 8x8 LED Matrix
- Add extra modules
  - I²C modules such as accelerometer, IMU, RTC
  - Buttons, joystick etc
- Hackable via expansion headers for Digital, PWM, and Analog

PCB Render



PCB Front view

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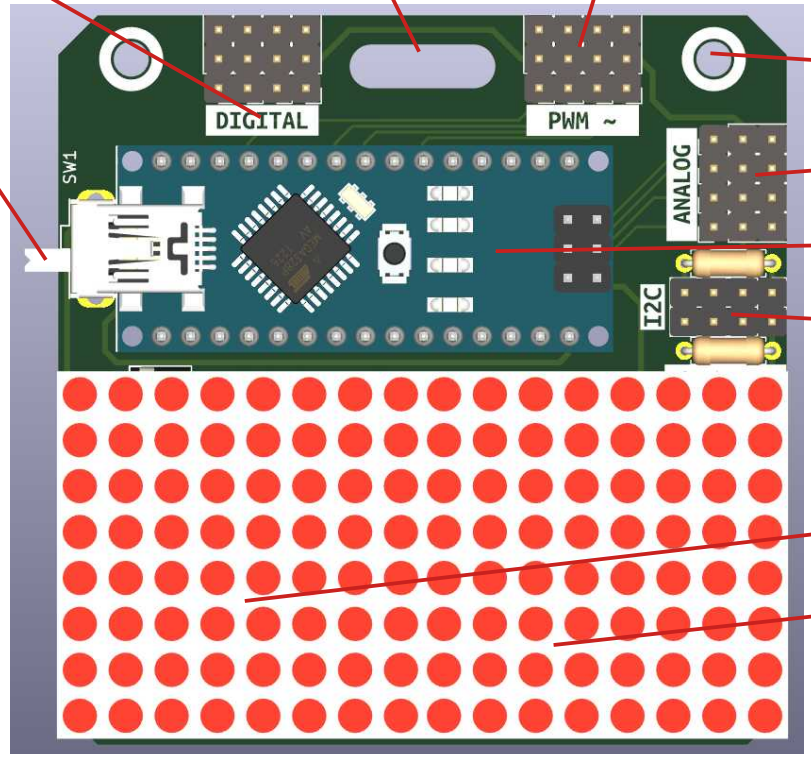


DIGITAL I/O

Lanyard slot

PWM ~ I/O

Switch

Mount holes, x4

ANALOG I/O

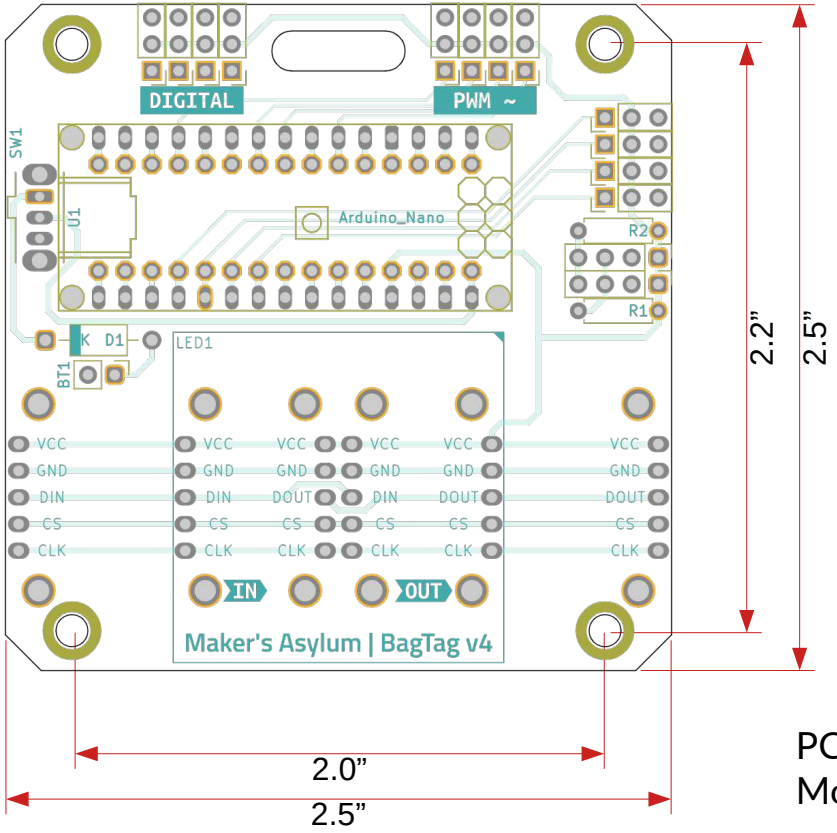
Arduino Nano

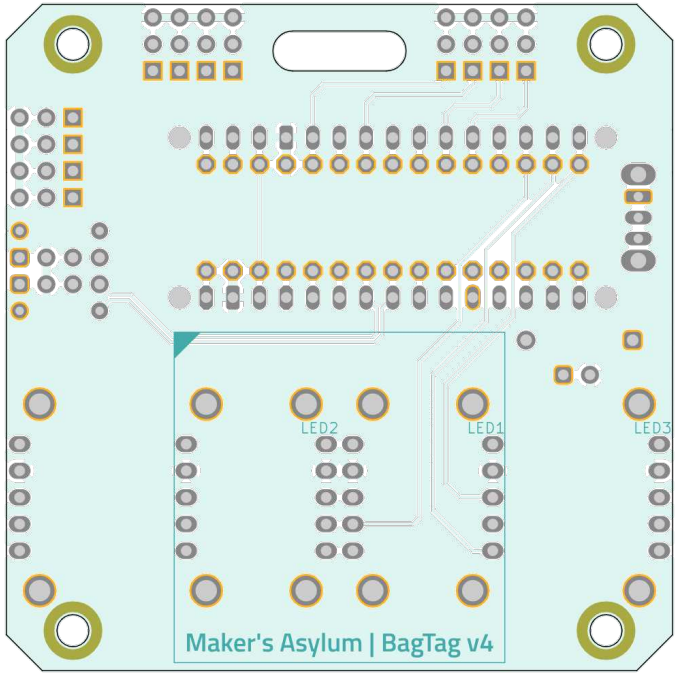
Spare I²C, x2

Display

2nd Display

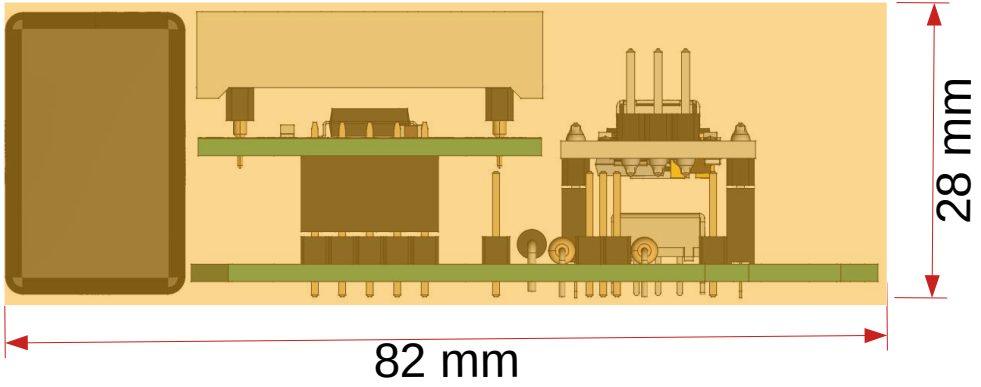
PCB dimensions

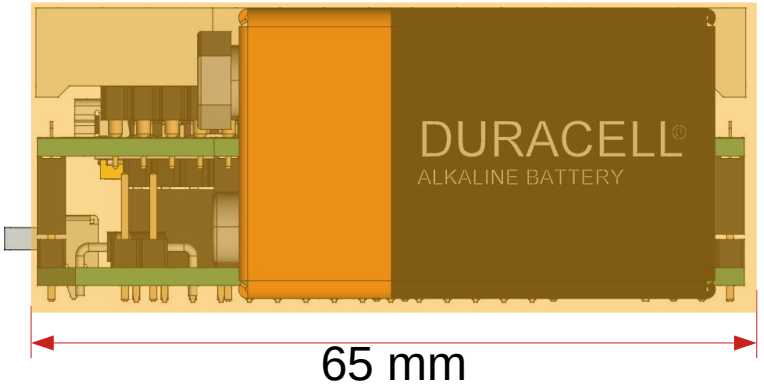




PCB = 2.50” x 2.50” (63.5 mm x 63.5 mm)
Mounting = 2.00” x 2.20” (50.8 mm x 55.88 mm)

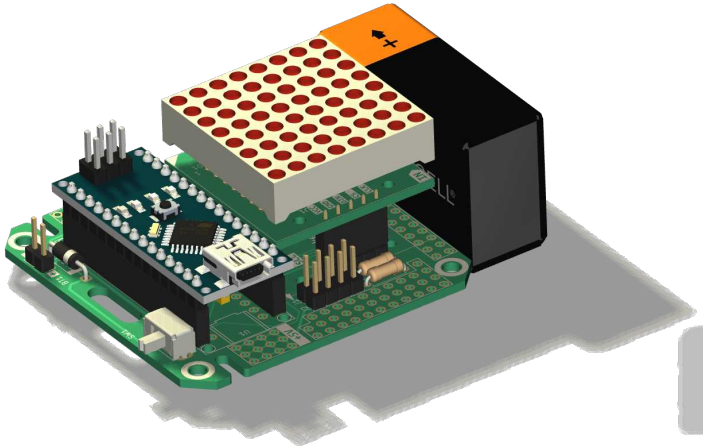
PCB Side views

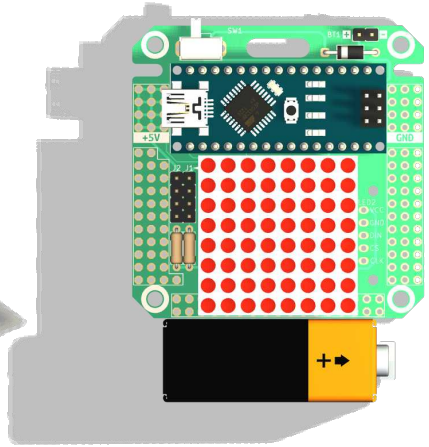




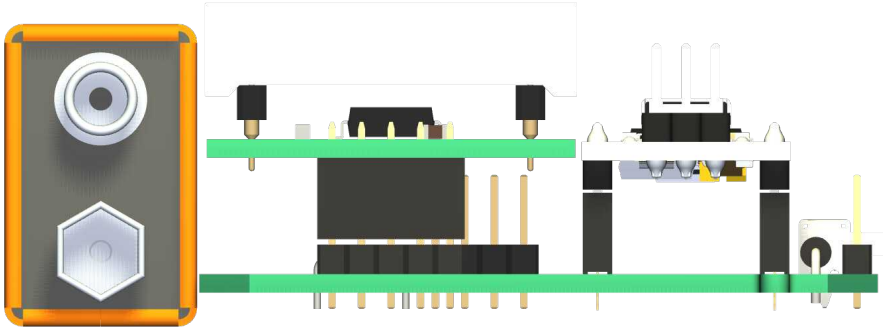
- Side views of the PCB.
- 8x8 LED matrix display and Arduino Nano require header pins and sockets.
- BagTag will fit inside a volume of 82 mm x 65 mm x 28 mm

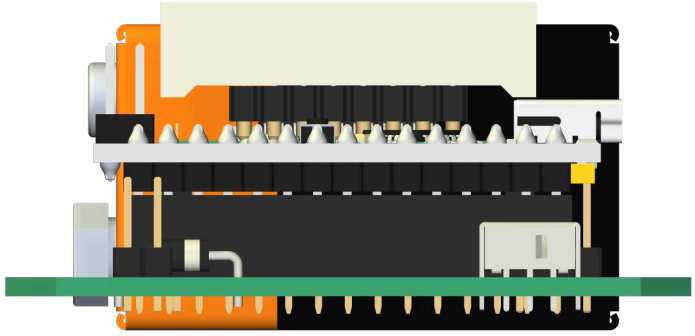
PCB Battery location





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





Enclosure suggestion

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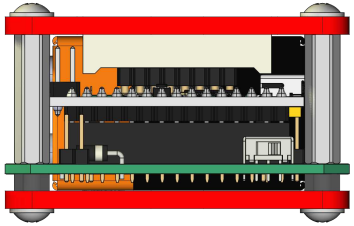

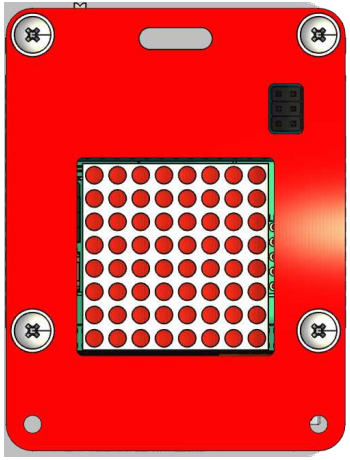

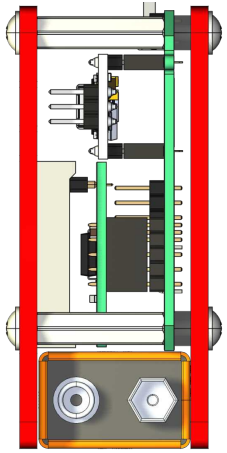

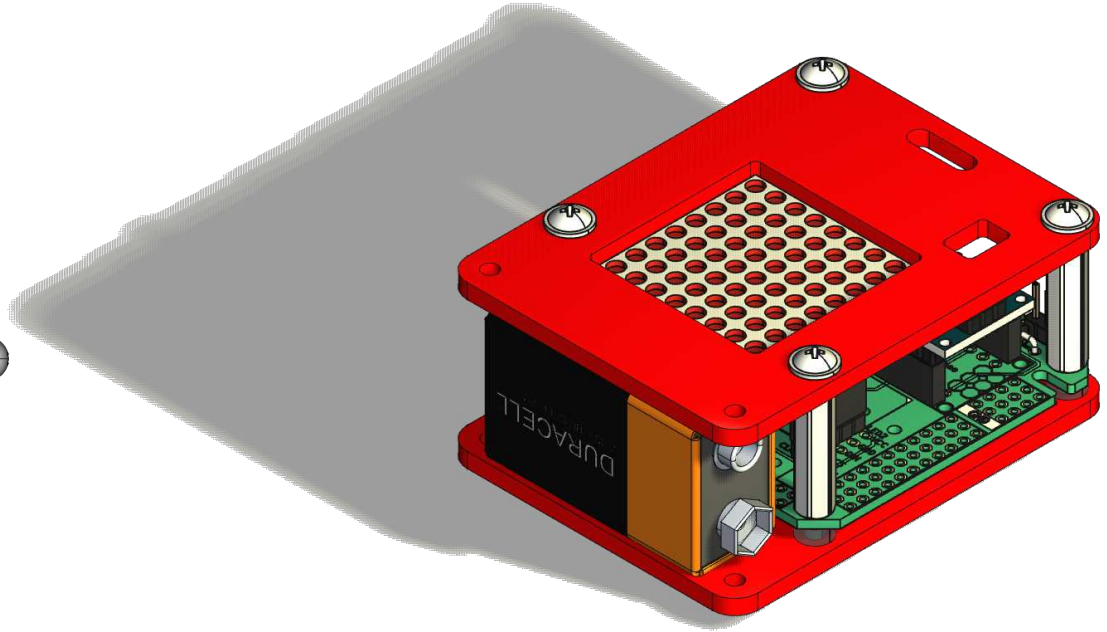

See exploded view at
~/fabricate/renders/BagTag_v3_exploded_view.mp4

Enclosure suggestions 2

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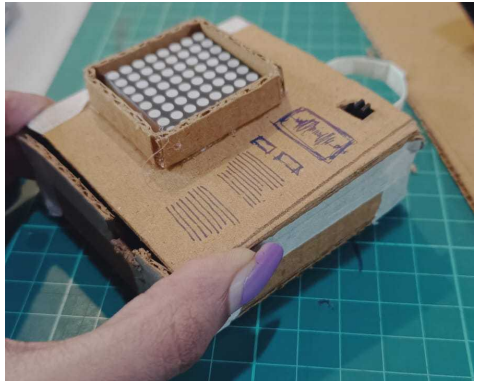

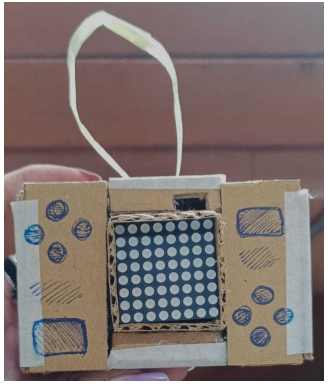

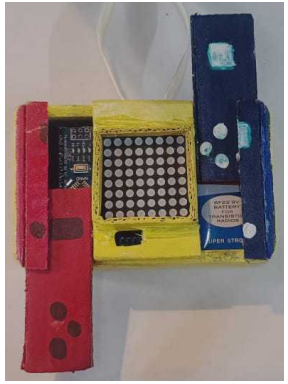

Hacking

- Two extra I^2C headers and expansion headers for future hacking
- Add a second 8x8 LED matrix, I^2C 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)